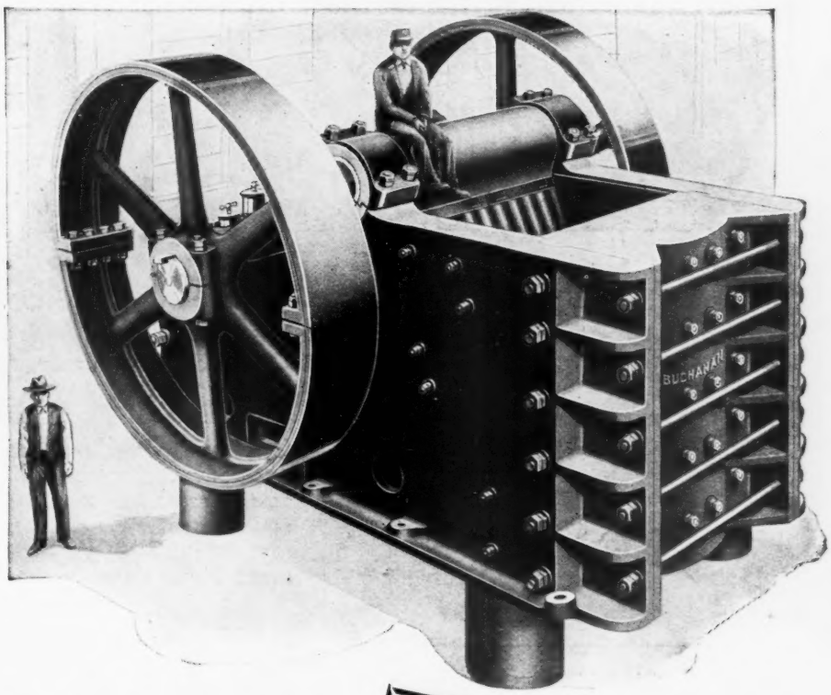
The Only Journal With a Paid Circulation in the Rock Products Industry

Rock Products

Chicago, June 14, 1924 FOUNDED 1902 Volume XXVII, No. 12

For Preliminary Crushing



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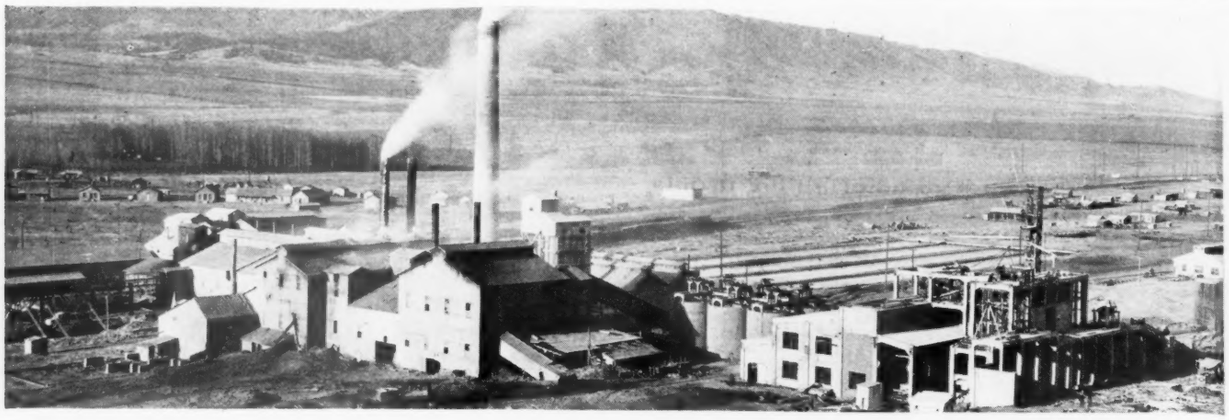
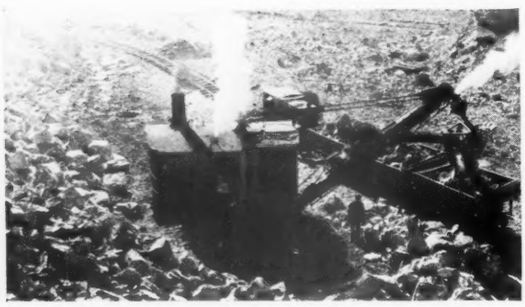
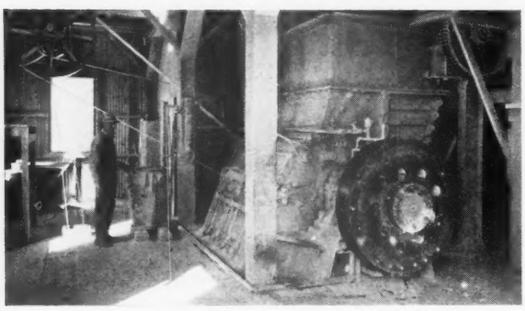


Crushing Steam Shovel Size Rock to 1½" at the Monolith Plant



Showing size of rock loaded by steam shovel and reduced to 1½ inches in one operation.



Williams "Mammoth" crusher and feeder as installed at Monolith plant.

One Williams "Mammoth" crusher does all the raw material crushing at the new Monolith Portland Cement Company Plant, Monolith, Calif.

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Volume XXVII | Chicago, June 14, 1924 | Number 12

Rejuvenating an Old Quarry Operation

Addition of New Primary Crushing Plant and Replacing Old Machinery with New Makes a Thoroughly Modern Operation of the Hagersville Plant

By Frank M. Welch
Chief Engineer, Greenville Gravel Co., Greenville, Ohio

ABOUT one mile west of Hagersville, Ont., along the main line of the Michigan Central railroad between Detroit and Niagara Falls, there existed previous to 1923 an old tumble-down crushing plant. The bins were not only inadequate but would not stand another season. The buildings showed the results of many years' vibration and resembled the leaning tower of Pisa. The roof was full of holes and portions of the siding were off. The machinery was inefficient, expensive to maintain, of small capacity, and, with the exception of the crushers, worn out.

The crushers, which were No. 7½ and No. 5 Austin gyratories, had many years' service left in them by renewing the heads, concaves and inner wearing parts. The quarry which this plant had served so long had scarcely been touched considering the acreage which still remained. The stone was of exceptionally hard quality, mostly flint, which made excellent ballast and had been used by the Michigan Central railroad throughout their lines in Canada since the road was built.

Frank B. Marble of Detroit, Mich., a railroad contractor and civil engineer, whose labors lay mostly along this division of the Michigan Central, foresaw and realized the possibilities of the old quarry if it were properly developed. He organized the Hagersville Quarries, Ltd., with headquarters at St. Thomas, Ont., and this company acquired the dilapidated property.

In planning the new, modern crushing and screening plant he established six fundamental objectives to work to, namely:

View of plant from the quarry. New primary crushing plant at right, secondary crushing and screening plant at the left

To build a plant which would produce a maximum tonnage with a minimum amount of power and labor.

To build a plant which, as nearly as possible, would operate continuously—that is, with few delays for repairs.

To have ample storage facilities.

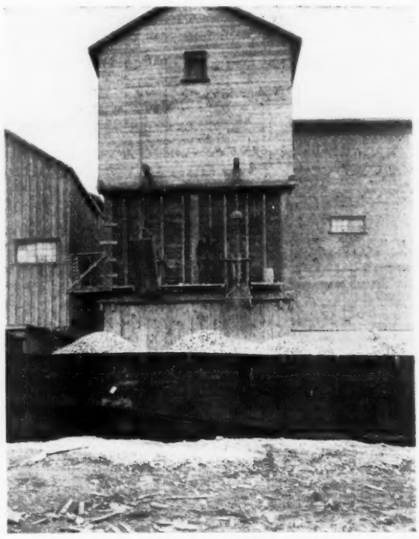
To have ample and quick-loading facilities.

To produce ballast and commercial material which would meet the most rigid specifications without question.

To utilize as far as possible any machinery, buildings, or material which could be salvaged from the old plant.

He accomplished these objectives and how he did it is well illustrated in the accompanying pictures. He purchased a 30-in. primary gyratory crusher which he set up about 140 ft. east of the old plant. Over this crusher an 18-in. I-beam, trolley, and 16-ton hoist handles the heavy crusher parts. In the crusher house is also a double drum friction hoist which handles two 5-yd. all-steel quarry cars up and down a standard gage, double track incline.

From the primary crusher a 36-in. inclined belt conveyor carries the stone to the top of the scalping house. This building, which consists of the old crusher house repaired and enlarged, contains a 60-in. by 21-ft. revolving scalping screen, the two old crushers, now used as secondary crushers, and a 24x12-in. steel bucket elevator. The elevator returns all crushed stone to the scalping screen where



Loading bins with rack and pinion gate and hinged apron

it is positively sized before going to the grading screen.

All stone which passes the scalping screen is carried by a 30-in. inclined belt conveyor to the top of the grading house where it enters a 60-in. by 22-ft. triple jacketed revolving screen. This screen and the grading house are built over a ground storage plant where 2000 tons of ballast and commercial stone are piled. The grades of rock are separated by concrete walls which also support the screen house above.

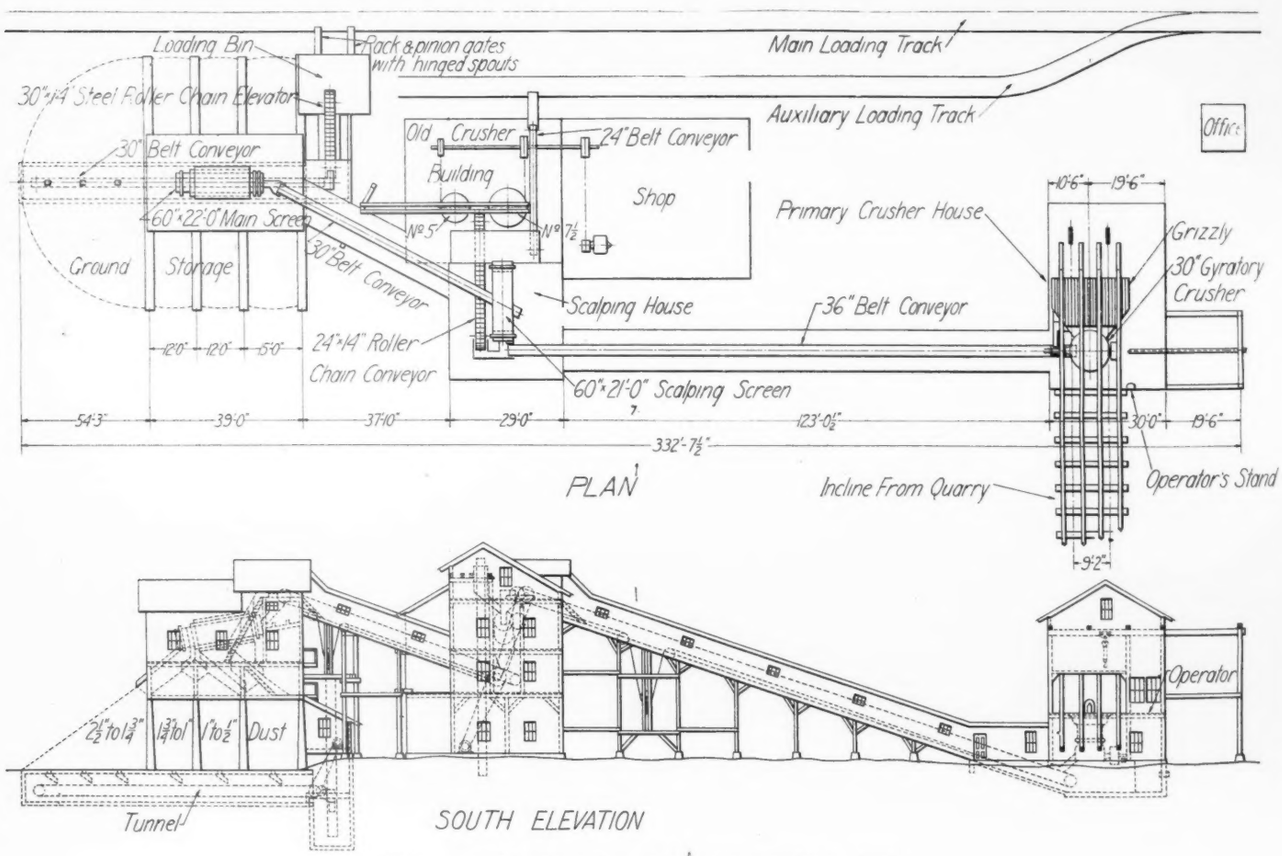
From the storage the stone is reclaimed by a 30-in. belt conveyor operating in a concrete tunnel under the center of the piles. Sliding gates and hinged spouts feed the belt at about 10-ft. intervals. This belt discharges into a 30x14-in. steel elevator which puts the product into the top of a loading bin.

The loading bin is equipped with two large rack and pinion gates and hinged spouts or aprons which facilitate quick loading of material.

In the scalping house an auxiliary 24-in. conveyor receives coarse stone from the discharge of the scalping screen and loads directly into cars for use in mass concrete or base work. The plant has a capacity of 40 cars of ballast and commercial stone per day.

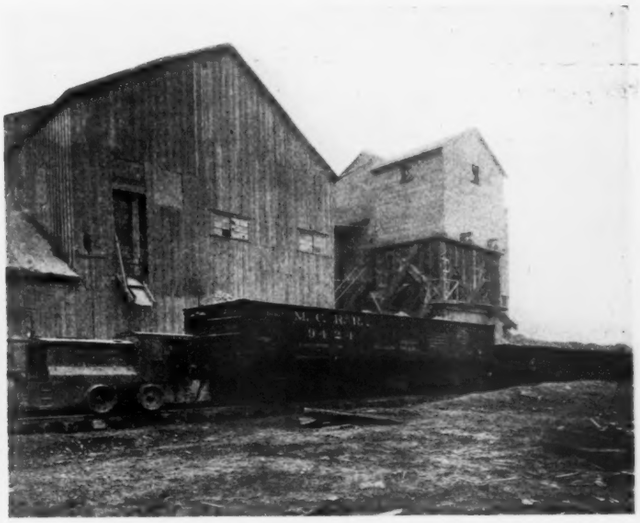
Efficiency in operation and maintenance is gained by the use of cast steel gears throughout, heavy ball-bearing conveyor rollers, and large safety factors in all parts. The elevators are made up of steel buckets or pans with reinforced lips carried on double strands of steel thimble roller chain, operating on cast steel sprockets and steel tracks.

A large machine shop and blacksmith



Plan and side elevation of the new crushing plant

View of quarry with plant in background



Left—Ground storage, main screen house, and loading bin. Right—Old crusher house and loading bins

Face of quarry showing steam shovel and types of gasoline locomotives and quarry cars in use

Staff (from left to right)—Al J. Sanderson, superintendent; W. M. Downs, timekeeper; Frank Craine, pit foreman; Eric Bowly, electrician; J. S. Beck, assistant mechanic, and C. A. Anderson, master mechanic

shop, in charge of competent mechanics, keep all the wearing parts of the plant as good as new.

Three Plymouth locomotives handle the quarry cars and help shift the empty and loaded ballast cars.

The 30-in. primary gyratory crusher is a McCully, manufactured by the Worthington Pump and Machinery Corp.

The big double drum hoist which handles the skip cars was made by Marsh & Henthorn.

The I-beam trolley and hoist over the primary crusher was furnished by Chisholm-Moore Mfg. Co., Cleveland, Ohio.

The steel bucket elevators were furnished by the Webster Mfg. Co., Chicago.

The conveyor belting was made by the Allied Belting Co., Greenville, Ohio.

The screens, conveyor equipment, gates, transmission machinery, and steel chutes and hoppers were furnished by the Greenville Mfg. Co. of Greenville, Ohio.

The engineering and designing were done by the consulting engineering department of the Greenville Gravel Co., ably augmented by the resourcefulness of Frank B. Marble, president and general manager of the Hagersville Quarries, Ltd.

Portland Cement and Quarry Companies Win Rate Case

OF vast importance to the Linwood Cement Co., Davenport concern with offices in the Kahl building and quarry at Linwood, is a decision handed down by the Interstate Commerce Commission, readjusting freight rates on the company's product shipped to points in Illinois and amounting virtually to opening the entire state of Illinois to the company on a basis which will permit it to compete with other concerns in a similar line of business.

The decision is one of the most important rendered by the Commission in many months and the case, carried to the Commission by Traffic Commissioner George M. Cummins of the Davenport Chamber of Commerce, has been for many months in the course of debate by that body.

Dolese Bros. Co., operating a quarry at Buffalo, shares with the Linwood Cement Co. in the benefits to be derived as a result of the decision.

The two concerns filed a complaint with the I. C. C. more than a year ago, calling attention to a situation wherein they were practically barred from the state of Illinois as a market territory. For example, the rate to Galesburg from Linwood was $1.36 a ton for 65 miles while the rate from the Joliet district in Illinois to Galesburg was $1.26 for 88 miles. The decision of the Commission establishes a rate of 88 cents from Linwood to Galesburg.

Similarly, the rate from Linwood to Peoria, a distance of 101 miles, was 99 cents while that from Joliet to Peoria, a distance of 121 miles was only 88 cents. The Commission has established this rate at 88 cents. To Springfield, Ill., the rate from Linwood has been $1.60 for a haul of 163 miles while that from Kankakee and Chicago, hauls of 136 and 177 miles respectively, was 88 cents to $1.01. The Commission has ruled that a rate of $1.26 from Linwood to Springfield is fair.

The importance of this case lies in the result that the Commission's decision opens up practically the entire state of Illinois to the Linwood and Dolese concerns. Heretofore the rate structure has permitted them to operate competitively only in the state of Iowa, and the Commission, by awarding a competitive basis of rates in Illinois, practically doubles the market territory to which the two concerns can now distribute.—*Davenport (Iowa) Times.*

Ohio Stone Company Electrifies Plant

ELECTRIC current from the local plant of the Dayton Power and Light Co. to the Wilmington Crushed Limestone Co. at Melvin has been turned on, the erection of the poles and other detail work preceding the act having been entirely completed.

Operations at the big stone quarry are now getting under fully way, work being retarded just a little due to the fact that some of the new quarry equipment, necessitated by the change of motive power, having not yet arrived.

The machinery at the quarry was formerly operated entirely by steam power, and the purchase of the big concern by the Casparis-Ohio Stone Co. of Columbus, and the eventual contract for electric power, resulted in the discarding of most of this equipment. The Dayton Power and Light Co.'s contract called for the providing of electric power to the quarry by May 20, at which time the quarry expected to be operating at "full blast," with the new machinery all "on hands." However, tardy arrival of some of the machinery has disappointed their expectations to some extent.

The Melvin stone quarry is one of the largest in this section of the country, covering six acres of developed land, with a lease of 45 additional acres. The supply of limestone, declared to be of A-1 quality, is sufficient to yield an average of 100,000 tons yearly for at least 100 years, experts estimate.

Quarry Worker "Takes Chance" and Falls to Death

ROBERT SPENCE lost his life while working for H. J. Carswell at the lime quarries on Redonda Island, in British Columbia, recently.

It had been noticed that there were indications of loose material near the top of the quarry, and it was decided to put in a charge of powder to bring away the insecure portion. Spence, with another man, was lowered by rope over the quarry for this purpose; but, unlike his companion, Spence did not fasten the rope to his body but relied on the grip of his hands. When the powder shot was fired the earth at the top of the quarry, where the men who lowered their companions were standing, became loose and somewhat undermined these men. The fall of earth that resulted seems to have caused Spence to lose his hold of the rope and to have carried him to the bottom of the quarry, a fall of about 70 feet, where he was partly buried with the falling material.—*Vancouver (B. C.) Province.*

Modern Methods and Processes of Mining and Refining Gypsum*

Part 1.—Introduction and Description of Mining Methods

By Alva Warren Tyler

IN recent years, the gypsum industry has assumed a position as one of the basic industries of the United States and while "gypsum" is still a word which means little to the layman, it has become well known to the business world, since its use in some form has become intimately linked with practically all construction work. In fact the outstanding progress of the larger gypsum producers has been so great as to cause the promotion of a large number of independent companies in various parts of the country and consequently to cause a general seeking of information, not only with regard to the material itself, but to the method of obtaining it and the processes of its manufacture.

Much has been written regarding the history of this great commercial product, as well as the theories of its geological origin. General descriptions have been written of

Alva Warren Tyler

the older European methods of refining gypsum, and the earlier practices in America. Little has been said, however, regarding the modern methods of mining and refining. In fact, a veil of secrecy has enveloped these processes to such an extent that not only has definite information been difficult to obtain but any information that may have leaked out, has been usually unauthentic and useless. It is the object of these articles to set forth in detail the complete processes and methods of handling from the crude rock, or gypsite, as the case may be, to the finished product placed aboard the cars. Since the United States is far in advance of the rest of the world, both in quantity of yearly output and improved methods of handling, these articles will be confined to practices in this country.

For the benefit of those who are unfamiliar with the commercial terms used in connection with gypsum manufacture it might be well to explain that there are at present two forms of gypsum produced in large commercial quantities; the "massive or rock-gypsum" and "gypsum earth" or "gypsite," the former being mined or quarried and the latter being recovered with plows and wheel scrapers, power shovels, or drag line scrapers.

While gypsum and some of its uses have been known since the dawn of civilization it has been left to America to develop new uses that have created a demand which has caused in turn, a growth of the industry of great rapidity and startling proportions. Fig. 1 will illustrate clearly the rate and volume of this growth in the United States. This great increase in production has necessarily developed new methods of handling, leading to more efficient operation and much greater plant capacities, and whereas a few years ago, a gypsum mill was a poorly designed, cheaply constructed and inefficiently operated affair (Fig. 2), today, we find mills of modern steel and concrete—a fire proof construction equipped with modern machinery, specially designed by capable engineers who have spent years in the study of the peculiarities of this mineral and proper methods of handling it in its various stages of manufacture (Fig. 3).

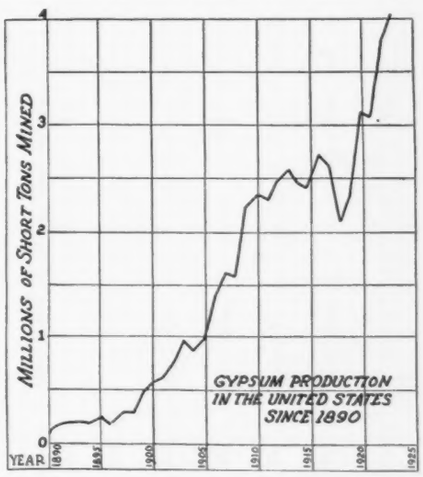


Fig. 1—How the gypsum industry has grown from 1890 to 1924

In order to follow the various operations as they are progressively described, Fig. 4 will serve as a helpful reference inasmuch as it visualizes the successive operations as they occur. This pertains to a rock-gypsum

THE author of this series was born in Michigan in 1884 and after his graduation from Armour Institute he went to the United States Gypsum Co. as designing and constructing engineer. He has held the position of chief engineer with the Crown Gypsum Co. (Canada), the American Cement Plaster Co., and the Universal Gypsum Co. He was superintendent of construction of the United States Gypsum Co.'s plant at Ft. Dodge, Iowa, one of the largest and most modern plants in the world, and designed and built the Crown Gypsum Co.'s plant at Lythemore, Ont. Later he designed and built rock crushing and handling plants for the American Cement Plaster Co. Besides this he has designed many special machines which are in use in the gypsum industry, including rock crushers, dryers and kettles, and also special elevating and conveying systems for handling and feeding gypsum rock, ground gypsum, stucco and other gypsum products. At present he is consulting engineer for the Spreckles Companies, San Diego, Calif.

ROCK PRODUCTS feels that it is fortunate in being able to give so complete and authoritative a presentation of the gypsum industry to its readers.—The Editors.

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plant. Fig. 5 illustrates a similar flow sheet for a gypsite plant.

In addition to the above processes in the regular manufacture of gypsum plasters, there are other processes and other products which will need to be included in these articles to make them complete, inasmuch as they are closely allied with plaster manufacture. These will be treated in their proper order under the subjects of wall board and wall board plants, wall board dryers, warehousing and shipping wall board, plaster block and block plants, roof and floor tile, plaster block machinery, retarders and retarder plants.

Gypsum Mining and Quarrying

The mining of gypsum is carried on extensively in the Mid-West and East, and in these localities it is a comparatively simple process, for the reason that the gypsum lies in an almost level strata of rock. The system of mining adopted almost universally is the "room and pillar" system. Access to most mines at the present time is by means of a vertical shaft in which is operated a pair of automatic cages for hoisting the cars from the mine to the surface. In some cases instead of a vertical shaft, a slope or incline in which is operated a skip or car is used (Fig. 6) and in still others the very favorable condition of a direct haul from mine to mill or crushing plant may be utilized when the entrance to the mine is gained through the side of a hill in which the deposit is located. Fig. 7 illustrates a mine which is operated in this way.

Ordinarily a mine is systematically developed, considerably in advance of the mill operation, the advance work being carried on according to a mine map prepared by the mining engineer. On on entirely new and undeveloped property, test holes are first drilled by means of a core drill, cores of each hole being carefully recorded on a chart. Sufficient holes are drilled to intelligently plot the continuity and thickness of the vein and to determine the dip if any.

The sinking of the shaft or opening of an incline, as the case may be, is a consideration of first importance, both from the viewpoint of location and design. The location should be in the lower point of the "dip" where possible, particularly where water in any quantity is known to exist or anticipated. This allows the water to flow back by gravity to a point where it can be conveniently and economically handled, leaving the working faces dry and unobstructed. The design of the track layout at the foot of the shaft should be such as to give as convenient and rapid handling of cars, both loads and empties, as possible. Loads should be run slightly down grade to the shaft in order to expedite the caging operation, proper safety devices being employed to prevent a string of loads from advancing except as desired. The loaded car should "buck" the empty from the cage as it rolls on, the empty rolling by gravity to a "switch-back" where it can be conveniently picked up by the locomotive bringing in the loads.

The "room and pillar" system is so called from the fact that the entries are driven from the main haulage ways and the rooms are driven off from the entries are driven at intervals of 15 to 20 ft. When the rooms have been driven to sufficient depth, cross cuts are made leaving pillars of approximately the same dimensions. The size of the pillar left will depend considerably on the height of the roof and general condition of the mine. Where a good solid strata of rock is found above, and the roof is not too high, a comparatively small pillar will suffice. In the low veins, 4 to 5 ft. in thickness, such as are found in west-

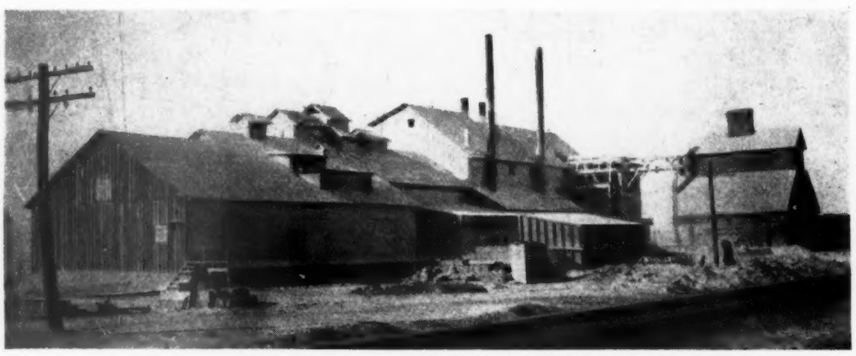


Fig. 2—The dusty, old-fashioned, wooden plaster mill

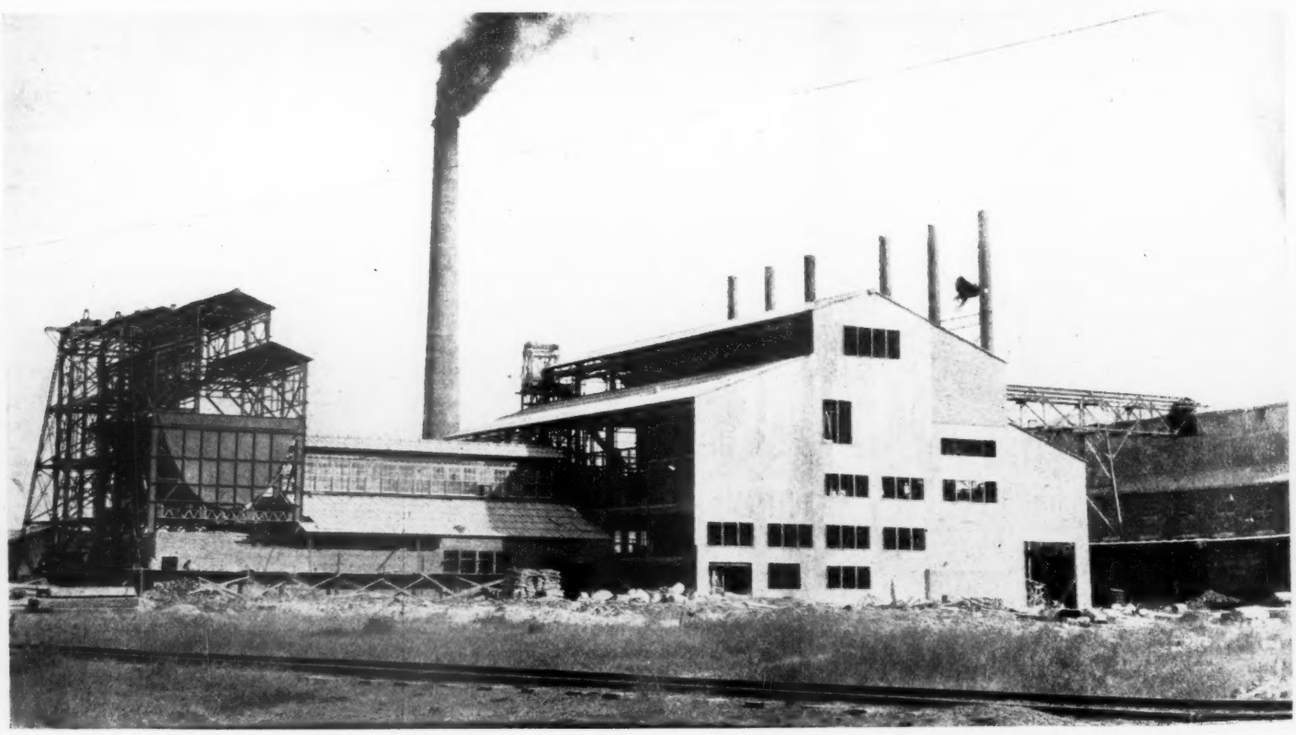


Fig. 3—A modern gypsum plaster mill, built of steel and concrete and equipped with specially designed machinery

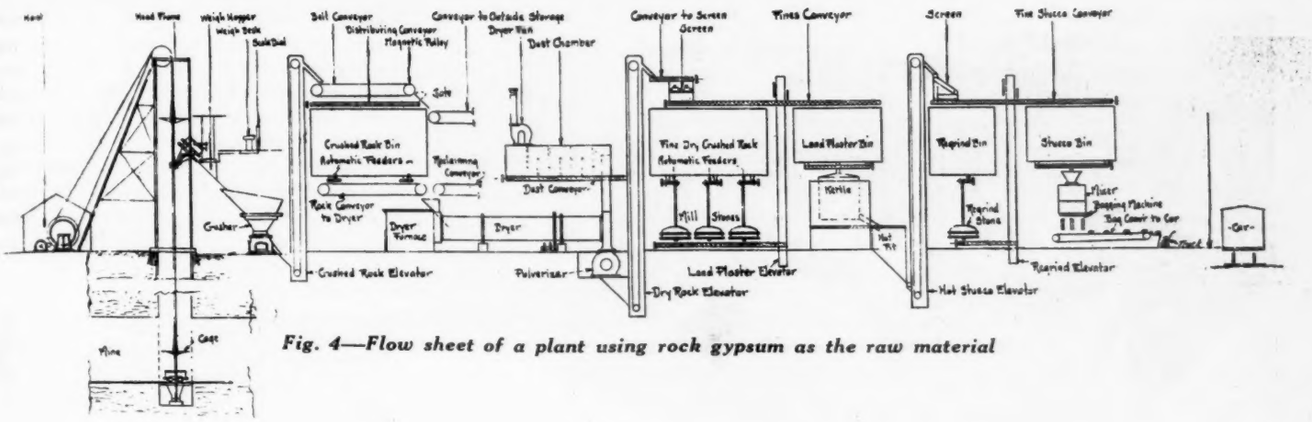


Fig. 4—Flow sheet of a plant using rock gypsum as the raw material

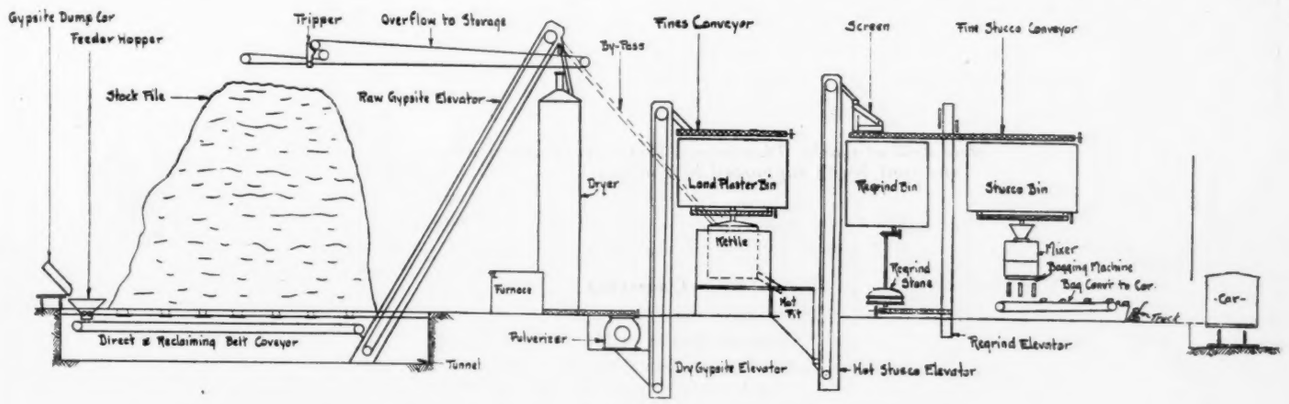


Fig. 5—Flow sheet of a plant using gypsite as the raw material

ern New York, no pillars are left at all, the roof being supported by timbering (Fig. 8); that is posts of about 8 in. in diameter which are set up at frequent intervals to support the roof.

Sufficient rooms and entries are opened to give the required rock capacity for supplying the mill; in fact a considerable excess capacity is provided for, as will be described later. The rock is usually drilled with electric drills requiring about 3 hp. to operate. In some of the harder rocks air drills are found to be more satisfactory. Their use requires about 10 hp. compressor capacity per drill. These drills are all of the rotary type and drill a hole of 1½ in. diameter and 2 to 8 ft. deep. The holes are loaded with dynamite cartridges, the quality of dynamite depending on the quality of the rock. From 15% to 30% "ammonia" is generally used although gelatin is used where the rock is wet. The Fort Dodge district uses 15% ammonia powder as a rule although some black blasting powder is used in the dry places. A very coarse grain black powder is used, of about "C C" grade which is very slow. In the Grand Rapids field, which has a different quality of rock, several different grades of dynamite are used as follows: 17% straight nitro-glycerin; 20% straight nitro-glycerin; 20 L. F. Extra and 40% gelatin. No black powder is used in this district. In the alabaster quarries of Michigan the 20% L. F. Extra or ammonia grade is used. All of these operations use the electric blasting cap method of firing. The holes are drilled and loaded so that the rock is shattered as much as possible without producing excessive fines. Larger rock which cannot conveniently be handled to the cars by two men, is further broken up by sledging or using light charges of dynamite. The latter method is known as "block holing."

Fig. 9 shows the typical method of drilling for a shot in a gypsum mine. It is not unlike the methods used in other mines. That is, the center of the face is drilled in a V-shape and is shot out first; the sides and roofs being shot to the center by delayed firing. The width of the face usually runs from 20 to 25 feet and the height between the foot and the hanging walls of course, depends on the thickness of the vein.

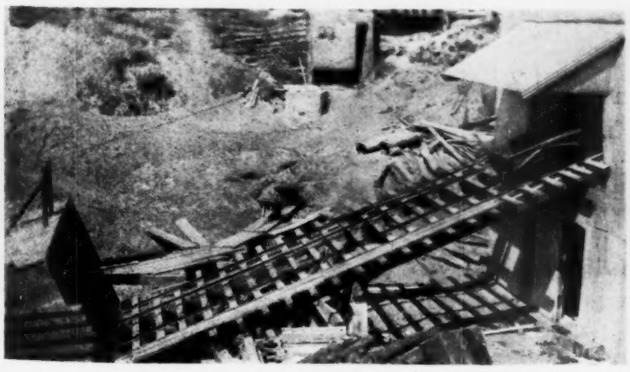


Fig. 6 (left) Incline from mine to plant. Fig. 10 (right) Wooden bodied cars used in earlier mining operations

Fig. 8—Showing rotary electric drill at work. This is in a low vein in which no pillars are left, the roof being supported by timbers

In the Fort Dodge, Iowa, district this height runs from 12 to 15 ft. The whole vein of gypsum cannot be taken in this territory as it is necessary to leave several feet of gypsum rock in the roof on account of the clay stratum above. In other mines such as Michigan and Western New York, where there is a sufficient limestone covering, the whole vein of gypsum may be taken out.

Two men are used on each drill, one acting as a driller and the other as helper. Two additional men are required for breaking and loading. This work is usually paid by the ton, the four men in a room producing approximately 100 tons per day of nine hours, thus averaging 25 tons per day per man. Loading cars is practically always done by hand. Mechanical loading devices successfully developed for other mines have so far failed to meet with approval in the gypsum field, therefore the size of the rock and height of cars are limited to the "two-man" method of loading.

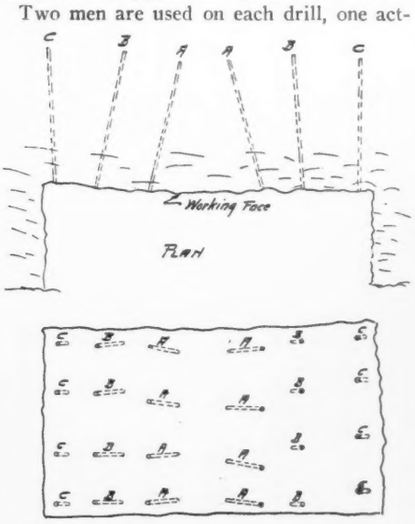


Fig. 9—Typical layout of holes for a shot in the breast

Quarrying

There are some open quarries; those in the Alabaster district in Michigan and Nova Scotia, however, being the more important operation by this method. In the far West are a number of gypsum quarries but at the present time the magnitude of such operations is comparatively small. In the quarrying operation we have a much more economical production, as the rock can be drilled from the top after the overburden is taken off and a greater quantity of rock may be obtained per shot; also instead of loading by hand, as is necessary in the mines, steam shovels may be employed and the loading cost greatly reduced. Where primary crushers of sufficient size are used, much larger rock may be loaded. In the Western quarries, where the mountainous formations are found, a gravity system may be worked out whereby the rock is delivered down an incline to the crushers and thence to the mill. This still further decreases the cost of the rock delivered to the mill.

Entrance to a hillside mine, in which the main haulage way is on the mill level

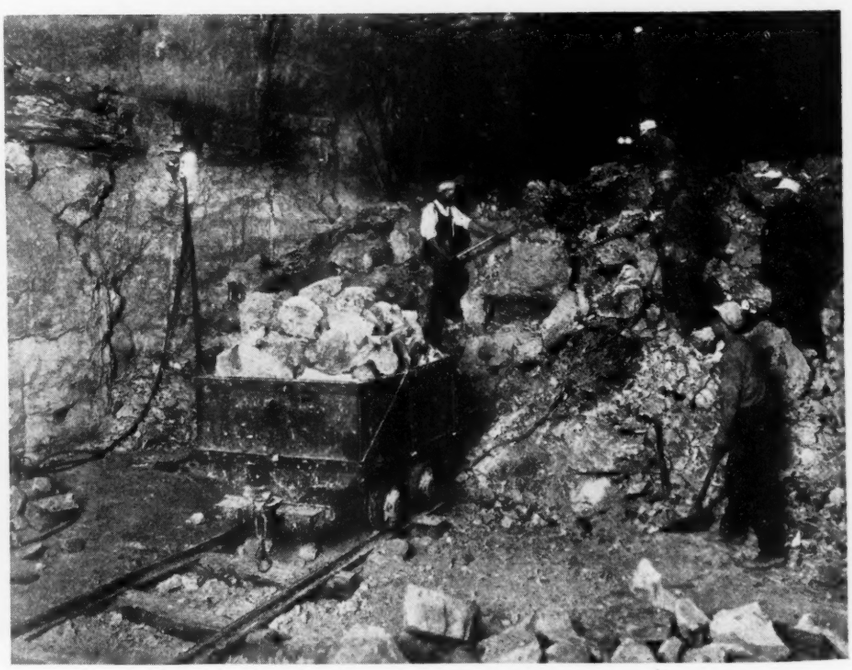


Fig. 11—Men working in a deeper vein. Note the modern steel car and the man drilling a big rock for "block holing"

Hauling

Mine cars, on account of the hand-loading system, are limited in their height dimension; the other dimension being limited by the shaft design. Thirty-six inches above the rail is about the maximum height of a car that can be economically loaded by hand. Cars of about two tons capacity are commonly used. In slopes or direct haul systems the capacity will run from three to five tons per car. In the earlier operations mine cars were built up with wooden bodies and solid steel axles and cast-iron wheels (Fig. 10). Mules were employed for gathering and hauling. The increased capacity requirements have made it necessary to improve the cars, using steel bodies and roller bearing wheels, thus making a much easier running and consequently more efficient car

Fig. 12—Western New York gypsum mine in which a "slope" is used. Note timbers which are to be taken down for roof supports

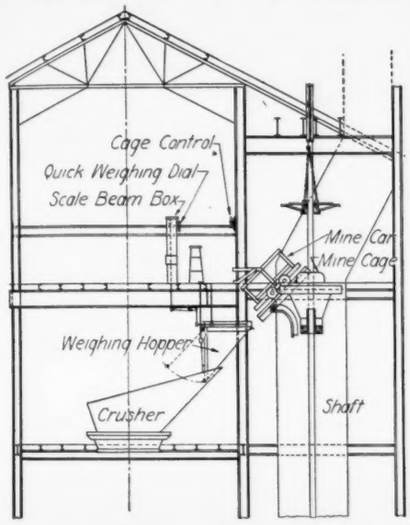


Fig. 13—Arrangement for dumping car to crusher at top of shaft

(Fig. 11). The main haulage ways have been equipped with electric locomotives making it possible to haul from 15 to 25 cars per trip. Mules are still employed for gathering although in some cases smaller gathering locomotives are being employed. Both storage battery and trolley locomotives are used, the trolley locomotive being the more satisfactory for main haulage, as the full capacity of the locomotive is always available, whereas with the storage battery type the capacity is often greatly decreased toward the end of the day's run. Also the battery requires recharging every night.

In some mines both trolley and storage battery locomotives are used, the former for main haulage work and the latter for gathering and while this is a comparatively expensive installation it has the advantage of more flexible operation, eliminating cables and reels necessary in trolley gathering besides eliminating the erection of considerable trolley wire and making it unnecessary to follow so closely to the mine development with the trolley system.

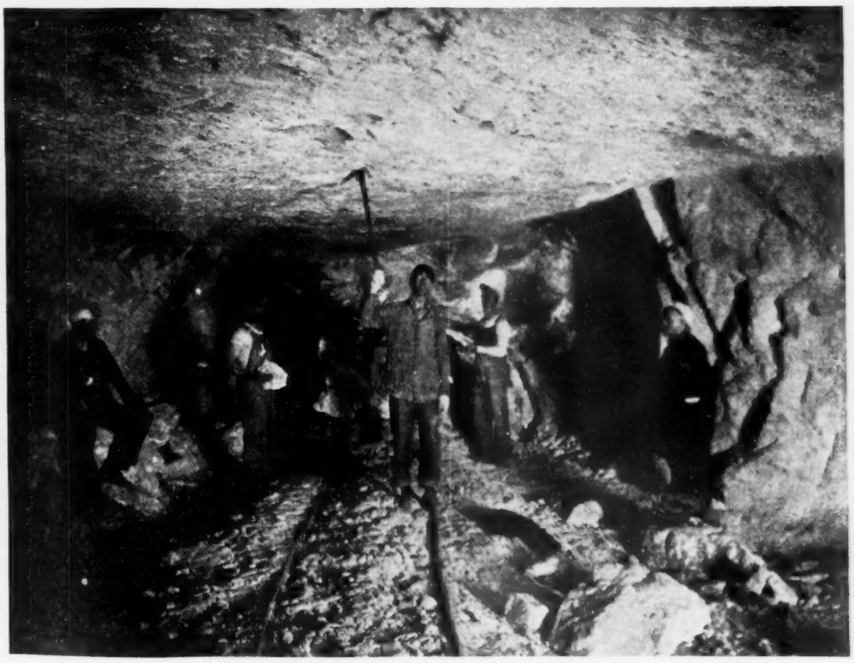


Fig. 14—A gypsum vein of convenient height. Note the perfect cleavage between the roof rock and the gypsum

Hoisting

The hoisting of cars in cages or of skips on an incline is done either by electric or steam hoists. The shallowness of most gypsum mines makes the electric hoist more desirable. Using an electric hoist, one operator can take care of hoisting and dumping, weighing and discharging the rock to the crusher, providing of course that automatic cages are employed. Under this system the cars are automatically locked on the cage as it leaves the foot of the shaft, and when the cage reaches the top the gate of the car is automatically raised and at the same time the cage platform is carried to whatever angle is necessary for the dumping of the car into the weighing hopper. This angle is approximately 45 deg. (Fig. 13). The weight of the rock is recorded on the quick weighing dial of the scale and the operator records this weight on his weigh sheet. On the door or some other convenient place on the car is a check hook carrying a check giving the number of the loader; this number is recorded in a column beside the weight of the car. In this way a daily record is kept of the tonnage loaded by each man in the mine. This record is sent to the office where proper credit is given. As soon as this weight is recorded the operator trips the weigh hopper, discharging the rock into the crusher, then signals the cager by means of a bell or whistle, indicating that he is ready for another car. The capacity of the hoist is usually considerably in excess of the mill requirement. This is necessary to compensate for any delays that may occur either in the mine or at the crusher, besides

supplying in a single shift sufficient rock to operate the mill for 24 hours. Most of the modern hoisting equipment has a capacity of at least two to three cars per minute.

Where steam hoists are employed it is necessary to have a hoistman in addition to the weighman at the top of the shaft. In this case the weighman signals the mine cager as soon as he is ready for a car of rock. The cager at the foot of the shaft signals the hoistman, who then lifts the car to the top. Outside of the additional man required to operate the hoist this operation is the same as with the electric unit.

The next article will treat of crushing and drying.

Seek Site for Pacific Coast Phosphate Plant

H. J. COLE and F. S. Irwin, of Spokane, representing the Pacific Coast Phosphate and Lime Co., in which they are largely interested, were on the coast for the purpose of selecting a location for treating the product that the company handles. They visited a number of places in western Washington sizing up the situation and reached the conclusion that Kelso held out more favorable inducements than any city that they had visited, a decision that may be followed by the final selection of Kelso as the place to carry on operations.

The Pacific Coast Phosphate and Lime Co. owns and controls an enormous deposit of good rock phosphate in Idaho, and an immense tonnage of the finest quality of high grade lime carbonates situated in Granite county, Montana.—*Kelso (Wash.) Tribune.*

Agstone in Kansas

THE Otto Feess farm east of Parsons is using 250 tons of crushed limestone this year and the State Hospital is using 150 tons on the state farm as a soil sweetener. Other farms are using a large amount of crushed limestone, among them being the Eichorn, Payne and Miller farms in the south part of the county.

The crushed rock tests 94% calcium carbonate of lime at the Hardman crusher, which is said to be one of the highest tests for any crusher in this part of the country. Mr. Hardman sells the crushed rock at $1.80 per ton at the crusher.—*Parsons (Kans.) Sun.*

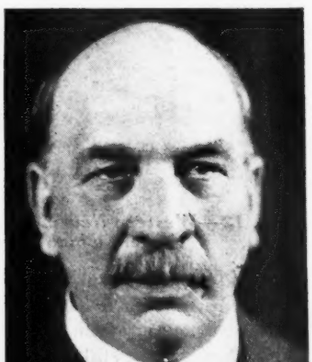
Death of William Hammerschmidt

WILLIAM HAMMERSCHMIDT, president of the Chicago-Elmhurst Stone Co., died at his home in Lombard, Ill., Friday, May 30. He was 70 years and 9 months old.

Mr. Hammerschmidt was not only widely known in the crushed stone industry but in business, financial and political circles in and around Chicago and throughout the State of Illinois. He was recognized as a political leader in Du Page county; in fact, "Bill" Hammerschmidt, as he was affectionately known, was considered almost indispensable in county affairs.

He was born in Naperville, Ill., and lived there until 1878 when he settled in Lombard (both towns are near Chicago). He married in 1882 and his widow and six children are still living.

He held the position of presiding officer in the St. Peter's Evangelical church



William Hammerschmidt

for 38 years and was always one of its strongest supporters, and he served for 24 years as president of the Lombard school board.

His connection with the crushed stone industry began in 1883 when he and his father opened the Elmhurst quarry. For 24 years he was president of the company and general manager. The business is now conducted by his sons.

Commenting on his long and useful life, a local paper says:

"The deceased was for more than forty-five years closely identified with the economic and political life of Du Page county. In 1882 he founded the firm Hammerschmidt and Company, in Lombard which is today the Lombard Brick and Tile Company. At the time of his death he was the president of this enterprise as well as of the Elmhurst-Chicago Stone Company, the Lombard State Bank, and the Lombard Amusement Company.

"His political career was as unique as it was long For 32 years he served York Township as supervisor, rounding his 17th term this spring. His integrity and scrupulous honesty in public affairs as well as his loyalty toward the interests of his fellow-citizens have become proverbial. "Big Bill" may have had his political opponents and enemies, but none of them could ever reproach him with an act of willful selfishness or with questionable motives in the discharge of his public duties."

Asphalt and Concrete Interests Fight for Indianapolis Paving

THE Indianapolis correspondent of Rock Products writes that all indications point to a finish fight in Indianapolis between asphalt and concrete interests for paving contracts. The two interests apparently are amassing their forces preparatory to one of the most bitter engagements these two have staged in the Hoosier capital for many years. The first move has just been made, apparently favorable to the asphalt interests. Six improvement resolutions have just reached the board of public works for the paving of streets in which concrete was not named as one of the materials which might be selected. The resolutions were submitted by Frank C Lingenfelter, city engineer, who was named to the office recently by Mayor Shank in place of John L. Elliott, who had held the position during the first three years of the present administration. The resolutions have been held up by the board of works, two members indicating that they will not vote for approval.

Mayor Shank is understood as being favorable to the elimination of concrete at least on the larger paving jobs. He suggested a double set of specifications, where by it would be possible to order alleys and small narrow streets paved with concrete, this material to be omitted from the specifications of other paving jobs.

For many months the board of works has been awarding street paving contracts under what is known as "open specifications." The city engineer argued that with concrete and asphalt interests bidding against each other, prices were held down. Lloyd D. Claycombe, a member of the city council has been retained as attorney by the concrete interests and some of the property owners abutting the streets in question and has objected to the board concerning the specifications. Under the state law four materials must be submitted to the property owners for the selection of a pavement. Where brick, wooden block, concrete and asphalt formerly had been put in the specifications, concrete has been changed to asphaltic concrete.

Michigan State Cement Plant Damaged by Fire

THE STATE cement plant at Chelsea Michigan, which was operated by the Michigan State Industries and managed by Warden Harry L. Hurlburt of the Michigan state prison, has been damaged by fire. Convict labor is employed in the operation of this plant.

Warden Hurlburt informs Rock Products that the damage from the fire was about $40,000 and that it will be repaired by rebuilding the same building.

Will the Wood-Pulp Paper Industry Move from North to South?*

If It Does the Lime Industry Will Feel the Effects Very Substantially

By L. B. Burt

Chemical Representative, Central Division, National Lime Association, Chicago, Ill.

THE total lime tonnage consumed in the paper industry approximates 10% of the lime sold in the country. We are not concerned with newsprint production as such because that does not involve the use of lime, it being a mechanical pulping operation, but it does effect the chemical pulp side of the industry because of its important demand on pulpwood, by reason of which it tends to accelerate the trend that this report aims to point out.

Since we mention the newsprint production as being a process not using lime, it may be appropriate at this point to state that we are concerned directly with the bisulphite process wherein lime or limestone is used for the absorption of sulphur dioxide, making the cooking liquor, calcium bisulphide, and with the soda and sulphate processes where lime is used as a causticizing agent. In the bisulphide process great inroads have been made on lime by the substitution of limestone used in the Jennsen towers. In the latter two processes, soda and sulphate, lime suffers no such competition. It will be seen that, nationally speaking, the total tonnage of lime should enjoy a substantial increase as the shifting of the industry proceeds.

Inasmuch as the inferences drawn from our investigation seemed important, we felt that if data from such a source as the governmental departments could be obtained that would either substantiate or refute our findings, it would be best to avail ourselves of them. The reports made available by the Forestry Division are brought up to and include the year 1922, and while much has developed since that time, we found that the government statistics greatly strengthen our deductions. Boiled down, the following facts are significant.

In 1905, 71.2% of all pulpwood was spruce. In 1922, 28.6% of all pulpwood was spruce. In the same period, i. e., from 1905 to 1922, pine consumption for pulp increased 636%. Spruce consumption for pulp increased 29%. Balsam fir consumption for pulp increased 443%.

Coming up to date, 19% of all pulpwood in 1922, meaning spruce and poplar, was imported, (principally from Canada). With the Canadian embargo in force, added to the large producing units built in the South since the 1922 report, we are safe in stating we have not misjudged the trend.

Paper Industry Biggest Consumer of Chemical Lime

More than half of the lime produced in the United States is consumed in what are termed, "chemical uses." Of these uses, the field of paper manufacture is by far the largest. It is therfore of vital importance that the National Lime Association should be informed on the conditions prevailing in the paper industry, particularly in new developments, future trend and shifting of locations. It is the part of progressive business to look ahead.

Until a few years ago practically all the paper pulp and finished paper produced in this country came from Northern states, in fact the mills hugged the Canadian border for the most part, New England, New York, Michigan, Wisconsin and some large units in Pennsylvania. The methods employed were the bisulphite and soda processes and more recently the modified soda process termed the "sulphate" process. Newsprint will not be considered in this investigation, its production being a strictly mechanical pulping operation in which no lime or any other chemicals enter.

Dolomitic lime is employed in the bisulphite process in making the cooking liquor, in the soda and sulphate processes high calcium lime is used for recausticizing the cooking medium. Any of these methods are used successfully when spruce wood is worked. Lime consumption has suffered heavy loss in the bisulphite process owing to the installation of the Jennsen towers, by the use of which bisulphite cooking liquor is made with limestone instead of burned lime. When pine woods are used, however, the bisulphite method cannot be employed because of the acid pine oils in the wood, confining the pulp and paper production to the soda and sulphate methods in which limestone is not a competitive material. (The possibility of employment of the bisulphite process on pine will be referred to later.)

The enlargement of a sulphate pulp mill in Wisconsin marks what is possibly the only instance of increased productivity in the spruce country. Two new mills that will work on Douglas fir are either projected or in course of construction in the Pacific Northwest. The old established pulp and paper industry in the north can see the end of pulp wood supply staring them in the face, with no prospects of a second growth. On the other hand they are confronted with the Canadian embargo. Lumbering in these Northern states has been very thorough and destructive forest fires have helped the denudation of millions of acres of virgin forest. Some development of pulp and paper mills by American capital has started on the Canadian side. How far that movement can be expected to progress depends on factors in the entire industry, and this investigation will show what may be expected from the Southern developments.

Southern Developments in the Paper Industry

(Here follows a comprehensive report of visits to prominent authorities on lumber manufacture and forestry in the South from which the following example of an interview with Mr. Gates, of the Crossett Lumber Co., a gigantic lumbering and sawmill organization operating Arkansas and Louisiana, is taken.—Editor.)

Mr. Gates spoke somewhat along these lines: "Some of us are getting pretty old and do not feel much like engaging in a venture that is as foreign to us as pulp and paper making, but we have been discussing it at all our board meetings for the past three years. Our short leaf pine has a very rapid growth, fifteen years of it here is equivalent to sixty years in the growth of spruce in the North. We have learned much in the way of helping nature do its best work; the fire hazard is comparatively low as we have many creeks and wagon roads to facilitate fire control, we have a strong corps of rangers

*Based on a paper read at the Sixth Annual Convention of the National Lime Association, White Sulphur Springs, W. Va., May 21, 1924.

over the workings, there is no long dry spell such as exists in eastern Texas, for instance, where the long dry grass retards the growth of seedlings and increases the fire hazard. Our lumbering equipment running efficiently is capable of handling additional tonnage if it should be wanted for pulping purposes, at most a little added rolling stock would fill the bill. We have a completely built community for workers, our labor rates are lower than those in the Northern States, we would not need to spend any money for heating the plant, there would be no need for stocking up pulp wood for many months run against the winter as all we would need at any time would be a few days requirements ahead of the lumber camps. At $13 per cord, the northern mills have vast sums tied up in such stock piles. We can buy cordwood suitable for pulp at $5 per cord from the surrounding country. Without increasing our present camp operations we could bring in right now, 100 tons per day in tops, limbs, etc., that are left on the ground. We are close to the sulphur supply, fuel is the smallest item of expense, being as it is furnished from our saw and planing mills in the form of shavings, sawdust and scrap. As for bleaching, the Forest Products Laboratory at Madison, Wis., has recently bleached some pulp made of our kind of wood, quite successfully, and it is only a short time before it will be worked out on a commercial basis."

At Bastrop, La., the Bastrop Pulp and Paper Co. is turning out 60 tons of sulphate pulp and paper per day, employing the same kind of timber as prevails in the Crossett acreage. This company has considerable timber but is conserving its own stand and buying all their present requirements of the farmers in the surrounding country. It was pulp from this mill that the Forest Products Laboratory experimented with for bleaching.

At Monroe, La., a plant is nearing completion that will have a rated capacity of 100 tons of sulphate pulp per day, also to operate on short leaf pine. This project is financed by the same people that have the mill at Orange, Tex. In order to assure pulp wood supply for this new plant, 50,000 acres have been bought outright and plans for perpetual operation are to be instituted.

Reforestation Will Make Industry Permanent

At Urania, La., Mr. Hardtner has been operating a lumbering concern, applying reforestation science so that his timber is increasing rather than decreasing. His output is 15,000,000 board feet annually, working 75,000 acres. It is now recognized as a perpetual operation.

The Southern Pine Association, offices at New Orleans, Mr. Berckes, Secretary and manager, were called on for information along the same line. All that Mr. Berckes had to offer was that a pulp and paper association is now being formed in the South, the first formal meeting having been held a few days ago, at which thirty firms that are either engaged in or are prospective makers of pulp and paper were in attendance.

R. D. Forbes, Director, Southern Forest Experiment Station, Customs Building, New Orleans, threw the first light on the question of taxation as pertaining to cutover lands and reforestation projects. Mr. Forbes speaks of the Pine Belt as all the territory contiguous to the gulf and the upper region of the coastal plain reaching up into the Piedmont section from North Carolina to Southern Arkansas. Most of the pine belt lying contiguous to the Gulf, from Florida to eastern Texas has been destructively stripped of timber, no seed trees having been left. There are a few exceptions where virgin timber still exists, such as the part near St. Petersburg, Fla. The upper belt, northern half of Alabama, Georgia, Mississippi, Louisiana and southern Arkansas, with very reasonable fire control and forestry methods can be made to yield perpetually, in twenty year rotation, that being equivalent to sixty years of spruce growth in the Northern States.

At some points the turpentine operators got ahead of the pulp industry. There seems to be a general awakening throughout the South to the values and possibilities of lumber conservation and reforestation. Considerable Eastern capital is at work in some of the pulp developments that are on foot.

Perhaps the largest organization engaged in lumbering and pulp and paper making in the state of Louisiana is the Great Southern Lumber Co. with the principal point of operations centered at Bogalusa, La. The Goodyear interests of Buffalo are the prime movers. At the Bogalusa Paper Co.'s plant, container board is being made, while a large addition is now being built that will produce finished Kraft paper and other grades. R. H. Laftman is in charge. This company has gone so far as to plant short leaf, long leaf, loblolly and slash pine seen by hand. They have also a nursery from which seedlings are obtained for regular plantings. On cutover lands they found that instead of leaving isolated seed trees, which cannot endure strong winds alone, and almost invariably die off, groups of seed trees are marked off in advance of the lumbering crews and these groups are carefully protected from skids, falling trees, etc.

This company controls 550,000 acres of virgin and cutover land and is now actually buying up more cutover lands.

The following is a quotation from Mr. DeKalb's writeup of this company's operation, "Under the forestry policy now adopted by the Great Southern Lumber Co. the supply of raw material for the pulp mill, instead of decreasing, will henceforth increase to a maximum estimated to be more than sufficient to admit of enlarging the paper mill to a total capacity of nearly 600 tons of all kinds of paper products per diem. Accordingly four new units as a separate plant have been authorized by the board of directors of the Great Southern Lumber Co. and the Bogalusa Paper Co." This was written three years ago; much has been accomplished since then and much more has been learned.

South May Produce 75 Per Cent of Paper of Future

V. H. Sonderegger, state forester of Louisiana, is strongly of the opinion that within ten years, 75% of the paper production in this country will be in the Southern States, or what is known as the pine belt. Mr. Sonderegger brought up a point that no other man mentioned during this investigation, and that is that the fastest growing tree in the southern section is the cottonwood. He wondered why no study has been made of the pulping qualities of that wood by the pulp and paper interests.

A number of large factors from Maine have called on Mr. Sonderegger regarding locations for pulp mills. The Joyce interests of Chicago have thousands of acres of cutover land and a railroad 69 miles long running through it that is a heavy tax burden. These interests have come to the conclusion that it is their only recourse to build a pulp mill in the vicinity of Rochelle, La., utilize what pulp wood can be had and start a program of reforestation, incidentally furnish profitable tonnage for the railroad which is just about abandoned.

Recently, letters from pulp and paper interests in New York State and Florida have been written to the Chamber of Commerce of Alexandria, La., inquiring as to pulp wood supply, freight rates, lime supply and analysis of same, and additional data. Geo. C. Merkel, general secretary of that C. of C. replied to these questionaires. In his reply he gave the analysis of a limestone deposit in Winn Parish, 5½ miles west of Winfield, La. This deposit is prescribed as being 200 acres in extent, with a depth of 996 ft. of solid stone. An analysis by J. L. Porter, dated 1918, described the stone as being of a quality equivalent to the grade of lime specified by the New Orleans Sewage and Water Board, quoting, "which is of a high grade commercial quality." A copy of that specification has come into our possession a short time ago and from that we could hardly agree that it calls for a high grade lime. There also seems to be a discrepancy in the analysis as reported by Mr. Porter.

SiO_2	1.25%
R_2O_3	1.50%
CaO	56.95%
MgO	1.20%
Sulphates	0.82%
$CaCO_3$	85.33%

How 56.95% CaO can be obtained from a stone analyzing 85.33% $CaCO_3$ is the part that seems strange. I tried to explain the matter to Mr. Merkel and to get him to see that such a lime deposit, undeveloped at present is not an attractive proposition for paper interests in so far as their lime requirements are concerned and that in such cases he would do much better by referring to such lime companies that are now in position to serve the paper industry and he could get all the help and information along that line he needed from the National Lime Association.

This same deposit of stone has been quarried and used for road building purposes and was found to be low in abrasive qualities.

Practicable Reforestation

This week, (the last week in February, 1924) the Industrial Lumber Co. at Elizabeth, La., has planted seed of slash pine. This marks the first actual reforestation work done by this company. The president, Mr. Hallowell is now definitely committed to a program of intensive reforestation work. This same Mr. Hallowell has been backing J. F. Carter in his researches on utilization of pine stumps. Carter's process aims to recover pine oils from the stumps after which the residue is used for paper pulp. They have been operating a 20-ton per day pulp mill, making sulphate pulp until a few weeks ago when it was found that the plant needed some radical changes, these changes being made now. A large sum of money has been expended up to this time in Carter's experiments and the whole affair is still considered as being in the laboratory stage. A great deal depends on the success of the venture, not alone for the Calcasiue Paper Co., subsidiary to the Industrial Lumber Co., but the whole future of the paper industry in the country would be greatly affected if this or a similar process becomes commercially successful.

Ordinarily, the resinous content in pine being acid, the bisulphite process cannot be applied, therefore the soda or sulphate methods must be used in the pine regions. In the Carter method the removal of these acid pine oils leaves a pulping material that can be cooked by either the soda or bisulphite method, thereby opening up other paper products fields besides Kraft to which the southern mills have been confined. The matter of economical bleaching would be automatically solved also.

Some of the old heads in the game are dubious about Mr. Carter's ability to prove his claims and do not hesitate to say so. Others are watching the progress at Elizabeth and are withholding future plans, pending the outcome. Among these are the Ragley interests that have cut out their holdings two months ago and debated whether they should start lumbering in the Northwest or adopt reforestation for pulp wood on their cut-over land in Louisiana. They have decided to stand by and await developments at Elizabeth. The Long Bell Co., Frost-Johnson, Finkline Lumber Co. at Jackson, Miss., are all watching these developments closely, while at the same time the Great Southern Lumber Co. and the Brown interests at Orange, Tex., and Monroe, La., have less faith in it, they are not letting anything in that connection get by them.

The pioneer of Southern pulp and paper making is the mill at Orange, Tex., known as the Yellow Pine Paper Mills with a present capacity of 60 to 65 tons per day, all in finished paper. This mill started in 1904 with a 30-ton soda mill, increased to 60 tons in 1914, changed to the sulphate process about 1916 and has been working on that basis since. No reforestation work is being done or considered; they have eight to ten years of virgin growth to draw on as is.

Significance of Southern Paper Industry to Lime Manufacturers

The last decade has witnessed the growth of sulphate production in the South from 30 tons to 600 tons per day and by the end of the current year production capacity will have reached 660 tons per day. That covers the southern states from Florida to eastern Texas. Add that to the Kraft paper production in the North, also three new mills, one of which is an enlargement at Fond du Lac, Wis., and two in the Pacific Northwest, the total will be more than the market requires and some time will elapse before normal consumption will grow up to it.

An idea of the importance of all this as applied to the lime industry can be gained when we consider that approximately 600 pounds of lime is used in the making of a ton of pulp.

The fact that newsprint is still the most remote of paper developments in the South indicates that all we have to look forward to is of the type of production that requires lime.

There is no market for pulp as such in the South, meaning that each plant plans to convert all of its pulp into finished paper.

Today the Kraft paper market is broken. All the mills selling at the present market quotations are losing money. Northern makers lose when they get less than 5½ cents per pound. Southern producers lose when the market brings less than 5 cents per pound. Sweden is dumping surplus and the extent of their loss is not generally known. With 500 tons of additional capacity now in course of construction added to the existing capacity, it would appear that capital will go slow before making further outlays. There is going to be some elimination. The odds are in favor of the South, decidedly against the Northern mills. The logical concerns that ought to survive are those that have going lumbering operations so that the overhead saving effected by the combined activities are the determining factors.

The shifting of existing mills will most likely be from North to South, rather than into Canada.

For climatic reasons, an earlier awakening to possibilities, and thanks to its forward looking legislation, Louisiana seems to be the leader of all its sister states in paper resources development.

New Benton Lime and Stone Company

THE Benton Lime and Stone Co. has been formed by William Lipstraw, Arnold S. Deringer and William Weller. This company has purchased the plant and property of the Benton Stone Co. at Limestone, Ohio.

The new company will engage in the production of high-grade dolomite lime and of crushed stone. The dolomite from which the lime is to be made is of unusual purity as shown by the following analysis:

	Per cent
Calcium carbonate	57.14
Magnesium carbonate	42.10
Alumina	0.36
Iron oxide	0.09
Silica	0.28
	99.97

The stone is of an excellent quality for highway material. The top 11 ft. shows an abrasion test of 4.7%; hardness, 16.2%, and toughness, 6%. The bottom 11 ft. shows: abrasion, 5.8%; hardness, 15.1%, and toughness, 5%.

The company is rapidly increasing its production facilities and will be in a position to deliver lime on a small scale in a short time. The plant is at Limestone and the office of the company is at Oak Harbor, Ohio.

Canadian Town Buys Gravel Pit for $1000

THE City Council of Chilliwick, B. C., has authorized the purchase of approximately five acres of gravel for street improvement purposes, after a recommendation of the road and streets committee. For years the city has been purchasing gravel from various private owners and recently has met with difficulty in securing supplies. The councilmen visited the gravel area where the bithulithic plant is located and interviewed the owner on the question of purchase. The price agreed upon was $1000.—*Chilliwick (B. C.) Progress.*

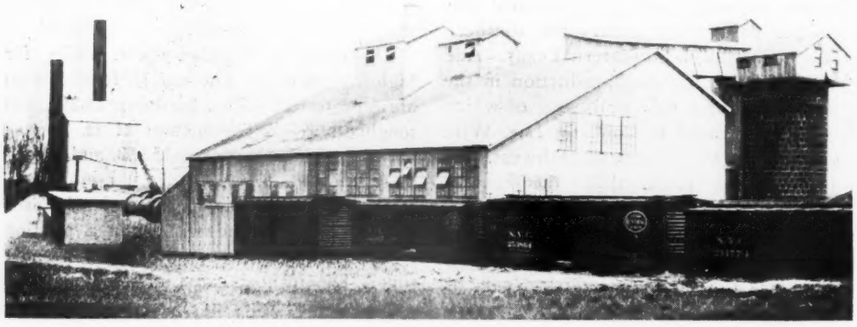
Rapid Growth of the Universal Gypsum Company

THE Universal Gypsum Co. has acquired the control of the American Gypsum Co. of New York, whose plant at Akron adds to their total capacity an output of 200,000 tons per annum. A note of this purchase was recently printed in ROCK PRODUCTS.

With their southern mill at Rotan, Texas, just completed and coming into production the first week of June, the company announces another unit of 100,000-ton capacity. With mills at Batavia and Akron, New York, and the Iowana and Plymouth mills in Iowa, and the Rotan property, the Universal has a total output capacity that registers third in the gypsum field and makes it one of the only three national producers of a full line of gypsum products.

Gypsum is one of the fastest growing basic industries and is establishing new records in the industrial field—50% increase each year in gypsum wallboard and over 100% increase in gypsum tonnage in less than five years. Large earnings have been shown in both good and bad years with companies having national distribution.

The Universal Gypsum Co. has an authorized 7% preferred issue of $4,000,000, of which over $1,500,000 are issued or subscribed, and an authorized common of 125,000 no par shares, with approximately 91,000 shares issued. The company has paid its 7% preferred dividends in full to date.



Plant of the American Gypsum Co. recently acquired by the Universal Gypsum Co. It has a capacity of 200,000 tons per annum

As an industry, gypsum has shown considerable resistance to business depression. This is exemplified by the following table:

While consumption (per pound per person) of many building commodities in the United States show a decrease in below mentioned period, gypsum and cement made substantial increases:

CONSUMPTION IN POUNDS PER PERSON

Building materials	1912-14	1920-22
Lumber	1,596.1	1,122.7
Cement	324.0	355.0
Gypsum	61.0	67.0
Sand and gravel	1,602.0	1,594.0
Stone	1,907.0	1,380.0
Clay	57.2	50.6
Lime	72.0	60.0
Common brick	498.0	307.0

It is also a notable fact that the gypsum companies with national distribution have shown consistent gain in net profits in both the years of business depression and in slack building periods. This is largely due to the consistently increasing number of uses to which gypsum products are being put. And also because in years of less construction there is always a large amount of repair work and gypsum products lend themselves to emergency work and extension and expansion that requires quick construction and unskilled labor.

New Sweetwater, Texas, Gypsum Plant

THE May 31 issue of ROCK PRODUCTS contained a notice of the opening of the new plant of the United States Gypsum Co., at Sweetwater, Texas. The following description of the operation is from the Dallas, Texas, *News:*

From 150 to 250 men have been employed on Sweetwater's new industry constantly during the last eight months. Construction has been rushed and completion reached a month ahead of schedule. The first unit, the rock crusher, was finished two months ago and on March 21 the first large shipment of gypsum rock went to a cement company for use in the manufacture of cement. The second unit, consisting of the crushing, calcining and mixing plants, went into operation recently.

Need for quicker and more economical service in gypsum building materials in regions where wood lumber is scarce was the primary factor determining the location of this industry here. Another factor was the opportunity presented by the Texas gypsum deposits, which, at this point, are equal in quality to the best in the United States and are estimated to be "of sufficient extent to supply the construction industry of the entire country, at the present rate of consumption, with gypsum plasters, wallboard, sheathing, floor, roof and partition tile for the next 100 years."

The United States Gypsum Co. began prospecting several years ago and in 1920 purchased 1000 acres of land three miles east of Sweetwater. It also has received in fee some 800 acres and holds under lease several hundred acres more.

These lands are located 250 miles west of Dallas on the Texas & Pacific and the Santa Fe railroads. They also are within easy access of the Kansas City, Mexico & Orient and other transportation systems.

This new mill is the only one in Texas producing wallboard and other gypsum products.

Quarrying already is under way on the property adjoining the mill; mining will be resorted to later, for there is a second vein of gypsum underlying the sandstone stratum which forms the present bottom of the quarries. From these deposits two forms of gypsum are obtainable, gypsite, or gypsum earth which contains a percentage of clay and from which dark plaster, haired, fibered and plain, is manufactured, and gypsum, the pure white calcium sulphate rock, which is worked into sheetrock wallboard, wall decorator, fireproof sheathing and fine plasters for wall finishes, for dental and orthopedic surgery and for use in the molding of pottery, in modeling sculpture and in the manufacture of glass. The presence here of both forms of the mineral makes possible the manufacture of scores of commodities, including "land plaster," or gypsum fertilizer.

Sweetwater's new industrial establishment is one of the leaders in this part of the state. It is fireproof and constructed of concrete and steel. It is run by electricity generated by two turbine engines in its own power plant. Oil from the Texas field is used in heating and generating power as well as in the calcining process. Though the mill now is considered by its builders to be complete, additional units for the manufacture of gypsum roofing will be constructed in future.

Rights to Purchase Pacific Portland Cement Stock

RIGHT to subscribe for additional stock of the Pacific Portland Cement Company were quoted on the San Francisco Stock and Bond Exchange at $17.50 bid, $20 asked, establishing a new high for subscription rights in this market. The company is offering 40,000 shares of new stock on the basis of two shares of new stock for every three now held, according to their letters to stockholders and brokers report active interest.

The company intends to finance construction of new operating equipment and it is reported that they are intending to purchase the lands of the old Morgan Oyster Company. These lands are bestrewn with oyster shells which contain lime for cement manufacturing purposes.

The Pacific Portland Cement Co. stock has been selling slightly above $100, the old par, but as the directors have placed the stock on a no par basis, these rights are firmly held, according to bidders who tried to secure them. The rights expire on June 30.—*San Francisco Examiner.*

A New Field for Sale of Rock Dust

Dusting Coal Mines Insurance Against Explosions

"STONE DUSTING," the method employed in British coal mines to prevent the widespreading of mine explosions, has proved more effective than the watering methods relied upon in most of the coal mines of the United States, according to an official mission from Great Britain which is now returning home after having spent several weeks in this country arranging for joint research work with the Bureau of Mines, Department of the Interior, under a plan officially agreed upon by the British and American governments.

The mission witnessed a series of coal dust explosion tests at the experimental mine of the Bureau of Mines at Bruceton, Pa. British Silkstone coal dust, similar to Pittsburgh coal dust, was used, and the tests indicated that the British coal dust required about the same amount of inert or rock dust as the Pittsburgh coal dust in order to prevent an explosion from starting; or, if an explosion of firedamp occurred, to prevent the explosion from propagating through the agency of coal dust, this being the cause of all widespread coal mine explosions.

Meetings with mining men were held in Pennsylvania, West Virginia, and Illinois at which the members of the British mission explained the method of rock dusting as used in Great Britain, where it is known as "stone dusting," and where some collieries have used it for more than 12 years. Its use in Great Britain has been compelled by law in all naturally dry mines since June 30, 1920. Since that time there have been no explosions in thoroughly dusted mines.

Except for a few mines, rock dusting has not been used in the United States, although it has been strongly recommended by the Bureau of Mines. Watering or humidifying has been relied upon in the coal mines of this country, but the numerous coal dust explosion disasters of the past two years, some of which have occurred in what were considered well-watered mines, have caused mining men to be suspicious of the efficiency of watering.

Bureau of Mines officials state that watering as a general method is a failure and they urgently recommend rock dusting. The method has several great advantages: It does not have to be applied daily in every part of the mine as watering has to be; the dust is visible and the presence of coal dust can be observed readily, which is not true in a watered mine; and the lightness of color of rock dust suitable for the purpose improves the illumination of the mine passages and so tends to prevent many individual accidents from haulage and dangerous roof conditions.

Many kinds of rock dust are suitable for the purpose, notably limestone and light-colored clayey shale free from flinty particles which would be unhealthful to breathe. The Bureau of Mines offers to assist mine operators in determining the suitability of material which may be available for the purpose of rock dusting.

The British mission consisted of Prof. R. V. Wheeler, Director of the British Mines Explosion Experimental Station at Eskmeals; Henry Walker, Deputy Chief Inspector of Mines of Great Britain, and W. R. Chapman, scientific assistant to Professor Wheeler. The party spent some time at the Pittsburgh Experiment Station of the Bureau of Mines and visited, under the guidance of George S. Rice, chief mining engineer of the Bureau of Mines, mining districts in Pennsylvania, West Virginia, and Illinois. In southern Illinois they saw at the mines of the Old Ben Coal Corp. the first general application of rock dusting in this country to prevent mine explosions.

Tentative Specifications for Rock Dusting

By George S. Rice,[1] J. W. Paul,[2] and Dr. R. R. Sayers[3]

STANDARD rock dust for use in the rock dusting of coal mines might be defined tentatively as powdered mineral, light colored, and free of carbonaceous matter and free silica, all of which will pass a 20-mesh screen, while 50% of it will pass through a 200-mesh screen.

Such dust may be prepared from limestone, gypsum, anhydrite, or shale free of sand and flint. For the initial rock dusting of the average nongaseous bituminous mines enough standard rock dust should be applied so that the combustible content of the resulting mixture of rock dust with mine dust shall not exceed 45%, a range somewhere between 35 and 45% being the practical objective sought.

All entries, slopes, or passageways and room necks should be rock dusted.

Additional safeguards are:

a. Rock dusting rooms;
b. Scattering of dust in vicinity of shots before firing;
c. Placing of barriers in the mouths of panels, cross-entries, and other key positions.

[1] Chief Mining Engineer, Bureau of Mines.
[2] Coal Mining Engineer, Bureau of Mines.
[3] Chief Surgeon, Bureau of Mines; Surgeon, U. S. Public Health Service.

Redusting becomes necessary whenever the combustible content of the mine dust exceeds the permissible maximum. This should be determined by regular, systematic sampling, followed by a simple analysis of the samples for combustible content. A Bureau of Mines volumeter for measuring the density can be used for the determination of combustible content.

In gaseous mines from 5 to 10% additional noncombustible is required for each per cent of methane present in the air current.

Detailed Specifications

Specifications for size and character of rock dust to be used in coal mines as a means of preventing disastrous explosions have not yet been standardized by the Bureau of Mines but so many inquiries have been received from mining operators and engineers who are considering adopting rock dusting for their mines that this memorandum has been prepared.

(1) Size of dust particles. The finer the size of particles of rock dust, the more easily is it raised in the air with coal dust to prevent the propagation of flame, if enough rock dust is used proportionally to the kind of coal dust found in any given mine.

Only such particles of either coal or inert material that will pass through a 20-mesh sieve are considered to be dust. Thus dust—whether coal dust or rock rust—would include particles ranging from 20-mesh (roughly about 1-30th of an inch in diameter) to the finest microscopic size. However, mine road-dust that passes through a 20-mesh sieve will vary widely in its proportion of the finest dust and correspondingly in its explosibility. From experience in tests at the Experimental Mine, the Bureau of Mines has adopted that percentage of dust by weight that passes through a 200-mesh sieve for the criterion of the most explosive size of any coal dust, also of the most effective size of inert dust to limit an explosion.

Also, the Bureau's experience is that rock dust should be ground until 50 per cent will pass through a 200-mesh sieve, but a dust having a smaller percentage through 200-mesh may be used provided: (a) That at least 30 per cent passes through 200-mesh, and (b) that a proportionately larger amount of the dust is used. For example, if the unit of weight of the finer dust required be represented by 1, the quality of dust having 30 per cent through 200-mesh would be determined by the proportion:

$30 : 1 :: 50 : x$ (x being the quantity required of dust 30 per cent through)

$30x = 50$

$x = \frac{50}{30} = 1.7$ or 1.7 times as much should be used as of the dust 50 per cent through.

These specifications are similar to those of the British standards of size as defined in their regulations, except in giving a slightly coarser dust. The British maximum size is 28-mesh, and although the criterion of the finest size is that passing through their standard 200-mesh sieve, this size corresponds to the size through usual American standard screen of 250-mesh.

(2) Character of rock dust. (a) As concerns composition and physical properties of the rock dust, less than 2 per cent combustible material is desirable, and it should not be as much as 10 per cent. If the inert dust contains any combustible material, 1 per cent increase in amount of dust should be used for each per cent of combustible material.

(b) Rock dust should be as light in color as possible both to permit ready observation of freshly distributed coal dust from the regular coal production operations of the mine and to increase the illumination of the passageways which tends to prevent accidents arising from poor illumination.

Should Not Contain Silica

(c) Rock dust should not contain an appreciable amount of silicious particles; and, dust from sandstone, and dust from sandy shale should not be used. Dust from pure limestone, dolomite, gypsum, and anhydrite are preferable. The dust from roof shale free from gritty material is extensively used in Great Britain, but not all roof shales are suitable; often they are too sandy or contain too much combustible matter. The Bureau of Mines is prepared to advise operators as to the suitability of the material or rock to be pulverized for coal mine dusting. Such advice may be obtained by submitting a sample of the material to the Bureau of Mines Experiment Station at Pittsburgh, Pa., where chemical, petrographic, and physiological tests will be made.

(3 The quantity of rock dust that must be used for initial dusting for any particular stretch of passageway depends upon:

(a) The character of the coal, whether high volatile or low volatile.

(b) Size of particles of the coal dust found on the road ribs and timbers as determined under specification (1).

(c) Percentage of inert matter naturally present, that is, moisture and ash of the coal and ash of dust from the roof, partings, and floor that has become mixed with the coal dust.

(d) Quantity of road and rib dust in the specified stretch of passageway before rock dusting.

General information on factors (a) and (b) can be obtained by studying results of tests of various coals in Bureau of Mines Bulletin 167, or by applying directly to the bureau.

Factors (c) and (d) can be determined by systematically sampling the dust in that part of the mine to be rock dusted in such a way that the quantity per linear foot of passageway can be estimated approximately. Practically, however, the way to start is to clean up a stretch of passageway and rock dust it, then from time to time sample the resulting mixture.

Redusting

(4) Redusting. After the initial rock dusting, samples should be taken at regular intervals to ascertain how rapidly coal dust is accumulating, and from the analysis to determine whether or not additional rock dusting should be done and whether cleaning up is necessary before redusting.

The rapidity with which coal dust is made in any mine varies with the friability of the coal, method of mining, and, most important of all, the spillage of coal in transportation by leaky cars and over "topping" the cars. These factors taken with the character of the coal dust and the amount of natural rock dusting make the quantity needed for continued dusting of a particular mine or district of a mine difficult to estimate without some trial. Some parts of an entry must be dusted every week; in other parts of a mine redusting will last for several months. In British mines the quantity of rock dust used daily in any one mine varies according to the conditions and size of the mine from 5 to 20 tons in the largest mines.

No Fixed Rule as to Quantity

(5) Maximum permissible percentage of combustible in road dust after rock dusting. It is not possible, as indicated above, to state the maximum permissible percentage of combustible content in road dust applicable to all mines. The amount depends on many factors and ranges from 75 per cent for semi-anthracite to only 25 per cent for certain pulverized high-volatile dusts. Conversely the minimum percentage of noncombustible content that will prevent explosion propagation varies from about 25 per cent for the least explosive to 75 per cent for the most explosive. If firedamp is present in any part of the mine, a greater percentage of rock dust must be used than in a mine practically free from gas.

Therefore, it is not possible to lay down a hard and fast rule that will apply to all the different conditions and characters of coal dusts found in the mines of the United States.

The British law says the dust on floor, roof, and sides throughout shall always consist of a mixture containing not more than 50 per cent combustible matter. In other words, there must be 50 per cent incombustible matter.

The results of testing coal dust from various mines of the United States, in the Experimental Mine, indicate that although 50 per cent of incombustible material (total ash plus moisture) will prevent ignition of many natural mine dust-mixtures, with no firedamp present; it will not suffice if some firedamp is present; and it will not prevent propagation of an explosion when strongly started, as by gas and coal dust at the face. To meet such contingency from 55 to 65 per cent incombustible matter is required to prevent propagation; and if one or two per cent of firedamp is present in the air current, 5 to 10 per cent additional incombustible must be used.

However, it must be remembered that the British regulation sets a *maximum of* combustible matter in any part of a mine and to meet this regulation it is found that the average combustible in the treated road dust of British mines will range from 40 to less than 30 per cent combustible, or conversely have 60 to over 70 per cent noncombustible.

Natural Dusts

Further, it must be remembered that the average natural road dusts in American mines, as determined by thousands of samples, contains usually over 20 per cent noncombustible (ash plus moisture) and sometimes 30 to 50 per cent, so that an additional amount of rock dust equal to the amount of coal dust present in a passageway (after it has been well cleaned up), may be sufficient ordinarily and sometimes a very small amount may suffice.

Subsequently, the amount required to keep the roadways safe, will depend on the control by the mine management of the production of coal dust. Rib and timber dust is much finer than road dust and contains less incombustible matter, consequently it requires a larger proportion of rock dust to make it safe against the propagation of an explosion; moreover, it is in a position which makes it easily brought into suspension as a dust cloud. In rock dusting, effort should be made to supplant the coal dust on timbers and rib projections, then the coal dust which is subsequently made and carried by air currents till it falls on these places will tend to roll off, as the angle of repose of coal dust is less steep than that of rock dust.

(6) Sampling. One of the greatest advantages of the method of rock dusting is that the danger or freedom from danger of explosion propagation through

the agency of mine dust, can be determined by sampling that part of the mine under suspicion and analyzing the samples. This more or less positive ability of determination of degree of safety during a period of some days or weeks is invaluable to the mine operator and the State Inspector, as systematic records of the condition of any part of a mine can be made.

The method of sampling in a roadway requires further development. The Bureau of Mines has heretofore been using a special sampling scoop with screen and brush and to take a sample of the dust about eight inches in width across the roadway, on ribs, and overhead timbers. All coal passing over a 10-mesh sieve is rejected in the mines. Before analysis the sample is dried, if necessary, and is then screened in the laboratory through a 20-mesh screen and the oversize rejected. This gives a fair sample of the dust at any one cross section of the passageway. Investigations are now being conducted to develop a protable vacuum cleaner device not requiring electricity, for such sampling.

Representative Samples of Dust

To a certain degree such small samples are grab samples, but if they are taken at regular intervals along the passageway, they give a fairly accurate average for the distance examined. An official test of this was made at the Bentley Colliery, Yorkshire, England, in which a comparison was made of an average of the analyses of many small samples in a given stretch of entry with the analysis of a gross sample obtained from shovelling and sweeping up the entire dust in that same length of roadway. The ash content by the two methods agreed within a few per cent, so the many small samples were regarded as fairly representative of the dust in the passageway.

(7) Analysis of road dust samples. A comparatively simple fire analysis will determine the total combustible of a mine dust except when limestone is used or other dust that loses carbon dioxide or water of composition. For such dusts these losses must be determined and added to the noncombustible material.

The Taffanel volumeter, modified by Fieldner of the Bureau of Mines, is a device for quick determination of the combustible content. It is based on density of the noncombustible material. Tests have indicated that it is accurate within a few per cent.

(8) Extent of rock dusting necessary in a mine. Questions are repeatedly asked such as: "How extensive is it necessary to carry rock dusting through the mine to prevent an explosion?" "Is it necessary to rock dust rooms?" "Is it necessary to rock dust entries?" In the opinion of the Bureau engineers, it is necessary to rock dust all passageways that contain any coal dust whatever. It is not enough simply to rock dust the rooms. Many of our most disastrous explosions have started in entry ways and even near the mouth of the mine, through ignition of coal dust by electric shorts from trolley wires or power lines or by explosions of bodies of gas forced into the entry from adjacent workings.

There is always the possibility of ignition of firedamp from one cause or another. Therefore, to prevent *ignition* of coal dust in a particular locality is not sufficient, the dust must be so generally neutralized as to prevent *propagation* of an explosion of a body of firedamp or of locally untreated or insufficiently treated coal dust.

The first step should always be to rock dust the haulage roads and dusting should be carried on into the cross entries, subsidiary entries, and air courses. The next step is to rock dust the room necks and then gradually extend the rock dusting up into the rooms. Rock dust close to the faces, although desirable is not so vital as thoroughly dusting in the entries, because an explosion starting in a room will die away on well rock-dusted entries.

Rock Dust Barriers

(9) Rock-dust barriers. The Bureau of Mines engineers believe that an additional measure of safety is to install rock-dust barriers at the mouths of all panels, cross entries, and other key positions, but the barriers should fulfil the specifications suggested by the Bureau in Technical Paper 84 to insure operation. Barriers should not be regarded as sufficient in themselves or as the most important feature. General rock dusting is much more important; the barriers should be considered only as secondary defenses.—Reports of Investigations, Department of the Interior, Bureau of Mines.

The British and French methods of rock dusting are described in Bureau of Mines Bulletin 225.

Owner Must Explain Why He Left Quarry Pond Unfilled

CORONER WILLIAM R. KNIGHT has ordered Joseph Perna, the contractor who owns the quarry pool at Sixty-fifth and Vine streets (Philadelphia) where two boys were drowned recently, to appear before him and explain why he has neglected to fill in the quarry hole as ordered by the bureau of health in September, 1920.

Although Coroner Knight has not actually charged Perna with criminal neglect, he said that he was determined to probe to the bottom the facts surrounding the drowning of the two West Philadelphia boys and four others reported to have met a similar fate in the same pool during the last four years. —*Philadelphia North American.*

May Try to Reorganize Monmouth Stone Company

ATTORNEY WILFRED ARNOLD is back from Chicago where he has spent two days in the interests of the Monmouth Stone Co., whose large plant near Gladstone is now in controversy in Federal court at Chicago. It will be recalled that several days ago the stockholders of the company held a meeting here and discussed the steps to be taken, the affairs of the company now being in the hands of a receiver. There are several stockholders here. At this meeting Mr. Arnold was authorized to represent them in the proceedings in Chicago. He says that the date of hearing had not yet been determined. It is possible that the bondholders, representing an investment of $300,000, may ultimately acquire the plant and pave the way for reorganization, or make the best possible disposition of the property.

Large Investment

The plant with its equipment for crushing stone represents a large investment, and the incumbrances against it amount to $600,000, of which $300,000 is represented by bonds and the remainder by a floating debt.

A strenuous effort has been in progress for some time to put the industry on its feet again. In its early months it had the appearance of being a paying venture. A large amount of crushed stone was turned out, and the company was in a position to supply constantly a large quantity. In machinery and buildings close to $300,000 had been invested. The stone had been examined by the experts of two or three states, and was pronounced of good quality. It is understood that the state itself had caused it to be understood that it would use a large quantity, and when it failed to do this a blow was administered to the infant industry.

It is the hope of the local stockholders that a way may yet be found out of the difficulties in which the industry has become involved.—*Galesburg (Ill.) Review.*

Citizens Protest Against Quarry Blasting

INCENSED over rock quarry disturbances in the neighborhood of Twenty-sveenth street and Willard avenue, a group of citizens of Kansas City, Kans., have requested the city commissioners to take some relief measure in their behalf.

Blasting of the rock, it was declared, is menacing the lives of the children and ruining homes. The leader of the committee said rock was being thrown 200 ft. in the air to fall where it might.

He also complained water from the quarry is running over the property in the neighborhood, making driveways impassable.—*Kansas City Kansan.*

To Remove Lignite from Gravel

Central Sand and Gravel Company Erects Splendid Modern Plant at Memphis

THE news that the plant of the Central Sand and Gravel Co. of Memphis, Tenn., had fallen into the Mississippi river, owing to the way the river had undercut the banks, was broadcast all over the United States in the latter part of last year. It was of sufficient importance to warrant this. But a story of far more importance to the sand and gravel industry as a whole, and to the concrete aggregate market in western Tennessee, has not received much publicity. In brief, this story is that the accident occurred just after the company had successfully solved the problem of removing lignite from Mississippi river gravel and was in this way making a commercial product of material that had often been rejected before.

The aggregate situation in Memphis and western Tennessee is peculiar. The city stands on the "clay hills" that form the eastern bank of the river. The geologists say these hills are loëss, or wind-blown, dirt. To the north of the city the "sunken lands" in which very little gravel is found extend to the Kentucky border. On the east is a belt of sandy country with only some worthless shale and sandstone until one comes to the easteren Tennessee valley about 150 miles distant. South the "clay hills" continue into Mississippi and west are the flat bottoms of the "delta" lands in Arkansas, excellent for raising cotton, but void of concrete material.

The bed of the river contains an ample supply of gravel but it is contaminated with lignite. Lignite in small quantities and in small pieces is not particularly harmful in concrete. But in larger amounts and in larger pieces it renders the gravel unfit for any use except perhaps as railroad ballast. The pieces of lignite "slack" on exposure to the air, and also they "pop" in the concrete, leaving cavities.

More than one attempt has been made to remove the lignite sufficiently to allow the gravel to be used as aggregate not only at Memphis but at other points along the river. In the main these attempts resulted in failure and some of them included the building of costly plants that had to be dismantled.

The Central Sand and Gravel Co. has tried to solve the problem by getting as clean a gravel as possible to start with and then removing what little lignite this contained. They prospected the river to see if some parts of the river bed did not contain less lignite than those near the city, and found a stretch in which there was considerably less than the usual amount, situated between 40 and 50 miles above the city. Then they sought a method of removing the small amount of lignite that had to be dealt with and found it in jigging, an operation familiar in coal washing. This was logical as, theoretically,

Stiff-leg derrick and unloading hopper at the foot of the main elevator. One of the 1200-ton barges shows at the right

Unloading hopper and derrick and the structure for the 400-ft. conveyor belt (32 in. wide) by which the gravel is brought to the plant. The bins and conveying system by which the gravel is distributed are shown at the right

there should be no difference in washing coal from rock or rock from coal.

Jigging depends on the fact that minerals of different specific gravity will stratify in an upward current of water, the heavier forming a layer at the bottom and the lighter going to the top. In a jig the upward current is intermittent, or pulsating. One may easily imagine what occurs when a pulsating current acts on the under side of a mixture of pebbles and pieces of lignite. At each pulsation the lignite, being much lighter, will rise a little higher than the pebbles until it finally works its way to the top.

The ordinary coal washing jig has to take off a very large quantity (coal) at the top, or overflow, and a very small quantity (shale or other rock) at the bottom. In removing lignite from gravel the proportions of top and bottom discharge are reversed, so the jig had to be designed with this end in view.

Aside from this the jig which was used did not differ materially from the ordinary coal washing form. There is a cell or compartment with a bar screen at the bottom and the gravel with the lignite is fed into this cell. The space under the screen is connected with another cell in which a plunger works up and down, driven by an eccentric. The motion of the plunger gives a succession of impulses to the water above the screen and lifts the bed of gravel and lignite and stratifies it. Discharge arrangements permit the two porducts to be taken off. As the cleaning is usually not completed in one cell a series of cells are used so that the final products are clean gravel and clean lignite.

The old plant had a jig that could put through something like a hundred tons a day. The box which was divided into a series of cells still stands by the river and it is shown in one of the photographs. The new jigs will be much larger and there will be two of them and from the data obtained with the old plant it is fairly certain that the two will handle 750 tons in 10 hours.

The old jigs which proved that lignite could be removed

For the new plant the gravel will be brought down the river in steel barges which are 138 ft. long and 32 ft. wide and which hold 1200 tons each. Barges of this size are more economical than the usual small-tonnage barges where the tow is long and where the water is deep enough to permit their use. It is expected that one of these barges will arrive at the plant and be unloaded every three or four hours.

The unloading device is a stiff-leg derrick with a 70-ft. boom and a 2½-yd. bucket, all of steel. It will drop the gravel into a steel hopper at the lower end of a belt conveyor which has 400-ft. centers.

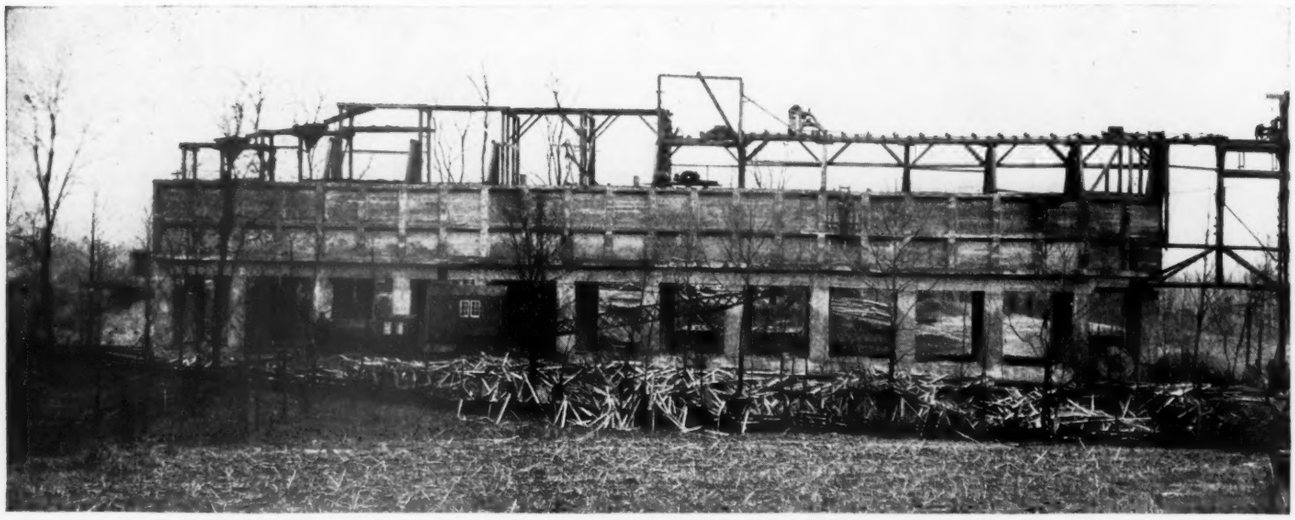
This conveyor will have a 32-in., 6-ply belt. It will run on rollers which have ball bearings and which are greased by the Alamite system. This is expensive as regards first cost but cheap as regards power, repairs, and maintenance, and this is especially true of a belt having such long centers. The belt is to be provided with gravity take-up and an automatic, non-return device to prevent it from running backward if the electric power goes off while the belt is loaded. The entire conveyor including the belt, except for the supporting structure, was supplied by the Stephens-Adamson Co.

From this belt the gravel will go to a scalping screen with 1¾-in. round holes. The oversize will fall through a chute to a No. 4 Kennedy crusher and the crushed product will be elevated to the same screen.

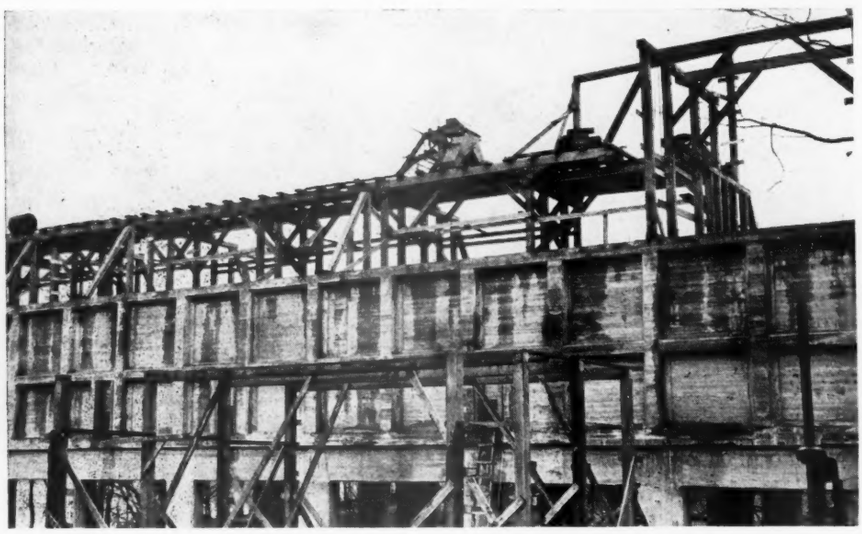
This screen is on a steel structure in front of the bins. The undersize from it falls on a flat conveyor belt above the bins on which there is a tripper for filling into any bin of the five.

These bids are called the "concrete gravel bins." A part of the material in them will be sold as railroad ballast and the remainder will be treated for the re-

What shows above water of the old plant that the river undermined



The splendid concrete bins which hold 125 carloads. The automatic sand settlers are seen at the left. To the right is the space for installing screens and farther to the right the belt which distributes the gravel to the unwashed material bins. The new jigs are on the other side of the plant



Detail of the distributing system above bins showing the movable tripper

moval of lignite by the jigs. Chutes from these bins discharge on a flat belt which leads to the jigs and feed may be taken from any bin or from more than one bin.

It will be remembered that the jig has a bar screen (spaced ½ in.) on which the sand and lignite rest. Sand and gravel finer than ½ in. are pulled through this screen by the upward motion of the plunger so that the jig separates the gravel into fine and coarse as well as freeing it from lignite.

The coarser gravel (plus ½ in.) goes by an elevator to a screen with 1¼-in. holes. The oversize, between 1¾ and 1¼ in., is called "coarse binder" in the local market and goes to its appropriate bin. The undersize, between 1¼ in. and ½ in., goes to the "fine binder" bin.

The jig undersize, ½ in. and finer, is elevated to a bar screen with 3/16-in. spaces. The oversize of this screen, which is locally called "torpedo gravel," falls to a bin and the undersize, sand, flows to two Stephens-Adamson sand settlers in series. The first of these is to produce a concrete sand and the second a fine sand for brick laying, tile setting and some kinds of plastering. The overflow of the second settler goes to waste.

The concrete bins have attracted a great deal of attention in the engineering world and have been many times photographed for publication in technical papers. In the first place they are unusually large, as they hold 125 cars (6250 tons). In the second they are an unusually good piece of concrete design and construction.

The Central Sand and Gravel Co. is a branch of the Fischer Lime and Cement Co., which is perhaps the largest company dealing in building materials in Memphis.

The design of the plant is largely due to L. T. McCourt, who is secretary of the company and who has charge of the operation of the plant.

The photographs were taken in the spring while the plant was under construction, and they show the details perhaps even better than pictures of the completed plant would show them. The plant is expected to be ready for operation some time this month or in the early part of next month.

New Sand Plant at Lorain, Ohio

WORK on the new sand and gravel plant started last week on the bank of the Black river, near Lorain, Ohio. The company which owns 200 ft. of lake front and about 900 ft. along the Nickel Plate railroad tracks plans to build a paved road down to the docks for trucks. Two sand suckers will bring the sand and gravel from the lake to the docks. Cranes will unload the sand from these belts onto a conveyor belt which will carry it to a hopper from which chutes will send the sand and gravel to railroad cars, on one side, and trucks on the other. Trucks can be loaded in a minute and a car in a few minutes. In addition to sand and gravel the company will handle fuller's earth.—*Upper Sandusky (Ohio) Chief.*

Sand and Gravel Company Adds New Equipment

THE Clinton Sand and Gravel Co. is installing considerable equipment at their pit, three and one-half miles east of Clinton, Ill. Equipment will include new bins, revolving screen, and additional scrubbing flumes. They will soon be turning out graded and washed gravel and sand in six different grades to meet the different variety of requirements. This company is owned entirely by Clinton citizens and members of the Clinton Chamber of Commerce.—*Clinton, Ill., Public.*

National Agstone Association Conference

Committee Meets to Receive Reports and Consider the "Country Gentleman" Attack, also Use of Rock Dust for Preventing Explosions in Coal Mines

THE National Agstone Association committee met at Cleveland on May 14, principally to receive the regular reports and the special reports of the agents who accompany agstone trains on different railroads. Incidentally some time was spent in discussing the recent attack on the use of agricultural limestone by the *Country Gentleman* and consideration was given to the use of rock dust in preventing coal mine explosions.

The reports of the agents of the Erie and New York Central roads were interesting and members were asked to make exhibits without marking analysis or price on their cards, the purpose being to sell the agstone idea.

The story in the *Country Gentleman* which attacked the use of agstone was pretty thoroughly discussed. Secretary Sandles said that he had sent letters to eminent soil experts all over the country and had received answers that showed that the story was in conflict with all that had been learned by years of research work. Replies were received from Prof. L. C. Bauer, chief of soil experiment field, Champaign, Ill.; Prof. C. A. Mooers, director of Tennessee experiment station; Dr. Firmin A. Bear, chief of the department of soils, Ohio State University; Prof. J. W. White, experiment station, State College, Penn.; Prof. C. E. Miller, associate professor of soils, Michigan Agricultural College; Dr. Chas. E. Thorne, former director of Ohio experiment station and now chief of soil fertility; Dr. C. G. Williams, director of Ohio experiment station; R. C. Towles, soil technologist, National Lime Association; Alva Agee, state secretary of agriculture of New Jersey, and Prof. George Roberts, agronomist of the University of Kentucky. All of these authorities spoke very strongly on the story, pointing out that the writer (a man named Cates) had ignored all the experimental data which had been gathered through so many years of patient observation as well as the practical experience of farmers with the use of limestone on soils. One or two letters pointed out actual misstatements of facts.

The entire series of letters is too long to publish here but the following examples will serve to show their tenor:

Prof. C. A. Mooers, director of the Tennessee experiment station, Knoxville, says: "This article is as near bunk as anything I have seen in a long time. Same line of argument could be used to condemn fertilizers. Over most of our state liming is essential to the getting of red clover, alsike, alfalfa, and sweet clover. Over western Tennessee lime works wonders. I think no one will pay any attention to the story."

Dr. Charles E. Thorne, former director of the Ohio experiment station and now chief of soil fertility, says: "I have not found sufficient reliability in that journal to make it worth while to read it. Life is too short to justify such stuff as the article referred to. In glancing over it I find one statement that is enough, viz., 'That a moderate estimate of the cost of liming is $15 an acre, while the increased productions due to liming has ranged from $3 to $9 an acre in eastern Ohio,' but facts make no difference to a certain class of writers so long as they can find editors sufficiently ignorant to publish their vaporings."

Dr. Firman E. Bear, chief of the department of soils, Ohio State University, Columbus, says: "After years of study of this problem it is my opinion that the highest type of agriculture is to be found where the soil either naturally contains carbonate of lime or where limestone is being applied regularly in sufficient amounts to retain the soil reaction at a point suited to the growth of more sensitive crops. Any man who has walked over the state experiment station farm at Wooster, or who has used limestone on his own farm, if his soil had been acid, is content to let such articles be written but is not inclined to believe that the men who write them know all about lime."

Secretary Sandles was directed to bulletin the replies that had been received.

The secretary points out in his report that the publication of this story has been resented by the authorities on soil treatment all over the country and that these are now more earnest than ever in their advocacy of limestone. In this way it is probable that the eventual effect of this story will be to the advantage of the agstone industry.

Rock Dust in Coal Mines

In regard to the use of rock dust for preventing coal dust explosions, letters were read from Prof. Oliver Bowles, chief of non-metallic section, Bureau of Mines, and J. W. Paul, acting chief mining engineer, Bureau of Mines. The use of limestone dust for this purpose is now recognized as having passed the experimental stage. J. A. King, of the Carbon Limestone Co., said that he had already sold several carloads for this purpose. All such dust must pass through 20 mesh and 50% must pass through 200 mesh.

New Portland Cement Company

THE White Cliffs Corp. of America has been formed to acquire the Krippendorf-Tuttle White Cliffs Products Co. The new concern announces its intention to build a cement plant with a capacity of 2000 bbl. a day.

Limestone Added $15 Per Acre Increase

AN increase of $15 an acre through the application of limestone was the verdict of 45 farmers who went on the limestone and alfalfa tour conducted by the Jefferson County Farm bureau recently.

Stops were made at the homes of C. L. Brawner, west of Center township, Frank Hankins, north Buchanan township, and Harry Parsons, south Buchanan township.

In each case the fields viewed were either red clover, sweet clover or alfalfa. On Mr. Brawner's farm was found the most typical all around demonstration as all three clovers were found growing on both limed and unlimed soil. On the limed soil in each case, whether clover, sweet clover or alfalfa there were found growing vigorous plants of a deep green color and a quantity and quality of hay that was almost beyind belief for this cold, dry spring. In deep contrast to this the unlimed soil had a light crop, running more to timothy and the small quantity of clover present was of a yellowish color and showing very clearly that some condition existed between the limed and unlimed soil reducing the general vigor of the plants.

When asked their opinion as to the difference of the indicated values of the crops on the limed and unlimed soil it was unanimously agreed by the 45 farmers on the tour to amount to at least one ton of first class hay which is worth $15 to any man feeding live stock.

When it is considered that the averaged length of time since this lime was scattered, is four years and that an average of two tons to the acre were used something of the great value of an application of limestone to an acid soil can be realized.—*Fairfield (Iowa) Ledger.*

Sales of Crude Feldspar in the United States in 1923

THE Department of the Interior, through the Geological Survey, has estimated from reports received directly from the producers that the crude feldspar sold in the United States in 1923 amounted to 140,700 long tons, valued at $1,035,000, or $7.36 a ton. These figures show an increase of 20% in quantity and 23% in value as compared with 1922. North Carolina was the leading state, reporting 40% of the quantity sold; Maine was second, with 18%; and New Hampshire was third, with 15%.

The average price per long ton in North Carolina was $6.34; in Maine it was $9.20; and in New Hampshire it was $7.48.

Feldspar is used principally in the manufacture of high-grade pottery, enameling, and scouring soap. Small quantities of specially selected feldspar are used in making artificial teeth.

The production by states in 1922 and 1923 is shown in the following table:

Hints and Helps for Superintendents

Siphon Drains a Quarry

THE picture shows the receiving end of a siphon of 6-in. pipe that is used to drain the quarry of Foster & Creighton at Russelville, Ala. The long leg of the siphon passes through a cut in the rock wall shown and is carried on about 150 ft. The discharge end of the siphon is about 35 ft. lower than the receiving end.

Siphon for draining a quarry

Of course the siphon has to be primed (filled with water) before it will flow. The priming water is put in through a short length of rubber hose which is connected to a tee. This is shown in the picture near the rocks. The hose is also connected to a line that comes from a 2-in. centrifugal pump in another part of the quarry. In priming the lower end of the siphon is plugged and the line is pumped full. When the water is issuing freely from the bottom of the vertical pipe shown in the picture, and no more air bubbles show in the pool the plug is withdrawn and the siphon starts. The priming line is shut off by a valve in the pipe.

Once the siphon is started it will run until the water is drained out unless there is a very large inflow of water so that the siphon has to run a long time. In a long run air accumulates at the elbow shown, which is the highest point in the pipe. This accumulation of air causes the siphon to become "air bound" and the flow lessens and finally ceases. The siphon then has to be primed to restore the flow.

Very large and long siphons have been used in the Western states for draining mines and quarries. Where these run continuously, automatic valves are put in at the high points to discharge any accumulation of air. The same type of valve is used in long pump lines to prevent "air binding." A pet cock put in at the highest point will relieve the pipe of air if it is opened in time.

Hints on Lubrication

MANY cases could be cited showing the absence of common sense in matters of lubrication. Some people are careless, and some are even over-anxious concerning a bearing.

Unless a bearing is in first-class condition, and in a quarry this cannot always be, a certain amount of heat is bound to be generated, and there is no need to be anxious about a bearing that warms up gradually to a new milk warm heat, or even if it remains bearable to the hand; but if it becomes unbearable when the hand is pressed on, it should be watched and felt at intervals, and if it smokes or can be smelled with the lubricant burning, stop it at once. In a long bearing one end heating more rapidly than the other should make one suspicious.

A crusher (being a heavy machine) requires a heavy lubricant. Heavy black cylinder oil is sometimes used with success on brass bearings, but the fluid nature of this lubricant encourages it to run through too quickly, unless very careful means are taken to prevent its too rapid escape. It is the custom in some quarries to mix tallow with this dark cylinder oil in order to thicken it. This is not always economical. Tallow in itself is not a good lubricant, as when melted it is too thin.

Good lubricating greases are obtainable, but these may be purchased at figures extending over such a large range of qualities and prices that it is sometimes tempting to try a cheaper quality than has been previously bought.

Price per pound should not only be considered, as some of the cheaper greases are heavier bulk for bulk than the better qualities.

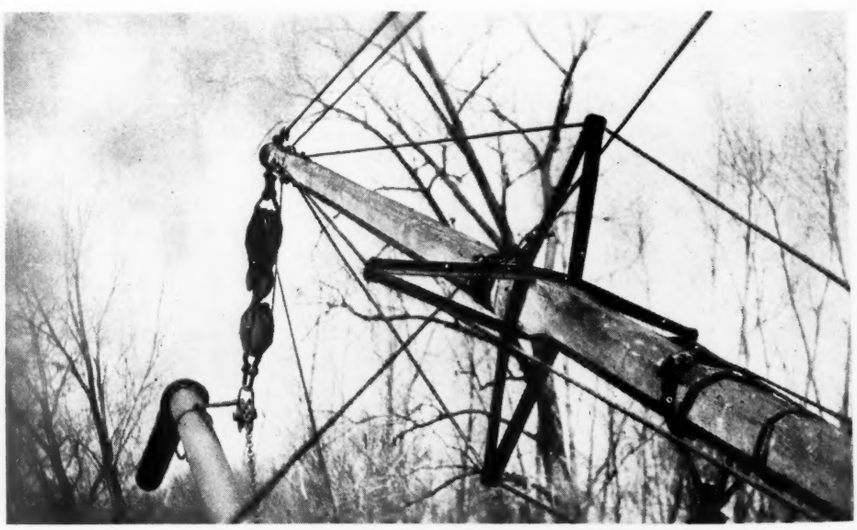
The same consideration of price and lubricating quality should govern the purchase of oils as well as greases.

Trussing a Boom

A GOOD way to truss a boom, so that it can be considerably lighter for the same strength, is shown in the cut. The star-shaped piece is bent from 2-in. angle iron and the rods are 5/8-in. round section.

This is particularly useful on a dredge where weight counts for so much. The boom in the cut is used to support a long dredge suction.

The installation shown is on a dredge belonging to T. C. Herbert & Sons, Nashville, Tenn., and used on the Cumberland river.



Boom for holding dredge suction trussed by four rods and a "star" bent of light angle iron

Keeping a Guy Line Tight with a Spring

A GUY line shortens and lengthens with the seasons and also with the differences between day and night temperature. Usually the effect is not noticed, but it may be noticed in case one line is in the shade of a building where it does not get the same amount of sunlight as the others.

The picture shows how guy lines can be kept from showing any of the effects of expansion and contraction. An old car spring is fastened to the deadman and the end of the guy line is tied into it. The guy line is then drawn taut in the ordinary way. The spring tension is enough to take care of expansion and contraction.

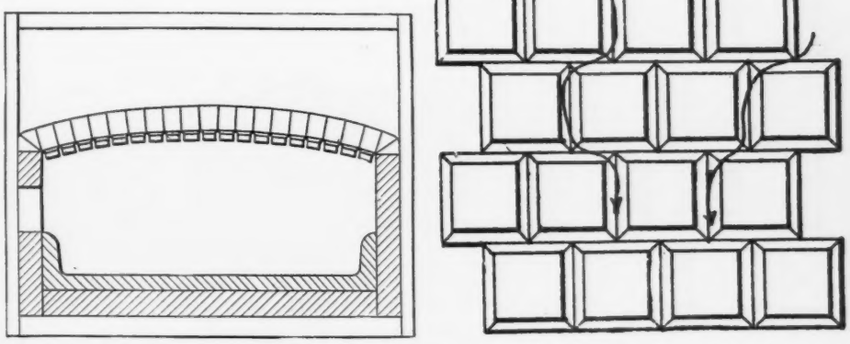
An old car spring holds this guy wire tight during all changes of temperature

Longer Life for Lime Kiln Arches

UNDER the title "Longer Life for Furnace Roofs" *Iron Age* publishes the following, which, it would appear, applies equally well to the arches of lime-kiln furnaces:

"As the ordinary open-hearth roof, made of silica brick in the usual method of arch construction, is good for only 200 to 300 heats on the average, investigators have endeavored to provide conditions which would lengthen this life and thereby reduce the cost of making steel. In the usual method of construction, the lower line of the arch is the line of maximum pressure, due to the weight of the brick and the various components of its reactions against the skewbacks. This line also is the line of maximum expansion caused by the action of the heat in the furnace, and it is also the line attacked by the gases emanating from the bath or fuel.

"In a new form of roof patented by Charles J. Crawford and handled by the Refractories Process Co., New York, there is separation between the line of the arch sustaining the maximum pressure and the line subject to both the maximum expansion from heat and the deleterious action of the gases. As shown in the diagram, there is a 4-in. projection below the structure line of the arch, in which projection the brick is ¼ in. smaller than at the arch line. Successive bricks in this 4-in. area do not touch each other, but are separated by a narrow passage which, as the bricks are staggered in laying up the roof, forms a labyrinthine passage. In an interview Mr. Crawford furnished the substance of what follows:



Left—Furnace section. Right—Diagram of the staggered laying of the brick. Arrows show path gases would have to take

"It is well known that silica brick under heat will expand. As heat continues to be applied they continue expanding until destroyed. This expansion is due to a series of inversions in crystal structure which take place under the influence of both the original burning of the brick and of long continued heating in use.

"Bond in a silica brick is due to the interlocking of these expanding crystals. The initial bond of milk of lime serves merely to hold the brick together while green, but disintegrates under extreme heat. As the silica brick pass through the several changes in crystalline construction, and reach their limit of expansion in the form of tridymite, the interlocking strength of the crystal forms gradually disappears.

"Because of this expanding and changing crystal structure under the influence of heat, each brick is put under internal strains which would cause it to rupture from brittleness if subjected to sudden temperature changes. By transferring from the working line of the arch to a projecting member the surface subject to the culmination of these changes, the strength of the arch is protected against their effect and an insulation is provided which will protect the arch until the 4-in. projection becomes worn away by the action of heat and fumes.

"It is obvious that, as soon as the projecting portion of the brick has been worn away in this manner, we revert to the condition of the arch we have known for years. So long as this protective quality lasts, brick made under this principle should form a more durable roof than those today in use. The tridymite gradually developed in the heated ends of the brick will slowly disintegrate them and, little by little, they will spall off, but in so doing they do not thereby weaken the arch. The rate of crystal inversion to tridymite is normally slow in the absence of any fluxing or catalytic action in the process. But many destructive compounds, fluxes and catalyzers are formed in the basic open-hearth process by means of the lime, fluorine, ferric oxide, phosphorus, sulphur and carbon monoxide present.

"In the so-called 'checker roof' described, the reduced end, being relieved of structural strains, can expand freely. As the staggered design used creates a thermal dam, keeping the highest temperate away from the line of the arch, this acts as a definite protection to that line. At the same time the fact of having the four free faces of each brick separated from its neighbors by a slight distance increases markedly the heating or radiating surface of the roof, as compared with present practice. This is analogous to the ribs on the cylinder of an airplane or other high-powered internal combustion engine, placed there for the purpose of radiating rapidly the heat from within the cylinder and, thereby, protecting the cylinder walls proper from deterioration due to excessive heat."

Powdered Coal

BULLETIN 223 of the U. S. Bureau of Mines, Washington, D. C., 92 pages, is entitled "An Investigation of Powdered Coal as Fuel for Power-Plant Boilers," by Henry Kreisinger, John Blizard, C. E. Augustine, and B. J. Cross. It describes tests at the Oneida Street Power Station, Milwaukee, to determine what over-all boiler efficiency could be obtained with pulverized coal under various conditions of furnace operation and with coal of different fineness and moisture content. The bulletin may be obtained free from the Bureau of Mines as long as its supply lasts; thereafter for 15 cents from the Superintendent of Documents, Washington, D. C.

New York State Stone Producers Have Active Association

New Organization, Born in February, Has Elected W. L. Sporborg, President, and George E. Schaefer, Secretary

AT AN informal gathering of crushed stone producers held in Buffalo, N. Y., February 28, 1924, it was decided to invite all those engaged in the industry in New York State to meet at Syracuse for the purpose of taking steps toward the formation of a State Crushed Stone Association.

In response to this invitation ten operators met in Syracuse, N. Y., on March 21, 1924. They were W. L. Sporborg, and A. G. Seitz of the Rock-Cut Stone Co., Syracuse; F. C. Owens of the Rock-Cut Stone Co., Auburn; James Savage of the Buffalo Crushed Stone Co., Buffalo; C. Leonard Heimlich, of the LeRoy Lime and Crushed Stone Corp., LeRoy; John H. Odenbach, of the Dolomite Products Co., Rochester; W. E. McMaster, of the Solvay Process Co., Syracuse; Carl Brunt, Geneva Limestone Co., Oaks Corners; Otho M. Graves, of the General Crushed Stone Co., Easton, Penn.; George E. Schaefer, of the General Crushed Stone Co., Rochester.

Mr. Schaefer was made temporary chairman and a motion to form the New York State Crushed Stone Association was duly made and carried.

W. L. Sporborg, president

B. R. Babcock, vice-president

W. L. Sporborg, president of the Rock-Cut Stone Co., Syracuse, was elected president; B. R. Babcock, vice-president of the Callanan Road Improvement Co., Albany, N. Y., vice-president; and George E. Schaefer, sales engineer of the General Crushed Stone Co., Rochester, was elected secretary. Membership in the new association was made individual instead of by company, and membership was made open to representatives of all companies engaged in crushed stone production in the state of New York.

Another meeting was held at Syracuse on April 11. Seventeen responded to the roll call. Various matters relating to local conditions in the industry were discussed.

The third meeting of the association was also held in Syracuse, on May 21. Twenty members were on hand.

During the forenoon the entire party made an automobile excursion to the plants of the Rock-Cut Stone Co. and the Solvay Process Co., at Janesville. At the Solvay plant Mr. McNasser provided a dinner at the quarry plant.

Following the return to Syracuse was a business session at which freight rates and other subjects of immediate interest to the industry were discussed. Members gave their views of the state of the industry, the concensus of opinion being that on account of the backwardness of the season, business was very light to date; also that the indications were that business would be quite heavy during the summer and fall months.

On June 1 the new New York State Crushed Stone Association had grown to 36 members as follows:

L. J. Bennett, Buffalo Cement Co., Ltd., 110 Franklin street, Buffalo.
Carl Brunt, Geneva Limestone Co., Oaks Corners.
B. R. Babcock, Callanan Road Improvement Co., 109 State street, Albany.
M. Bovee, F. E. Conley Stone Co., Munnsville.
J. E. Cushing, Cushing Stone Co., 248 State street, Schenectady.
F. E. Conley, F. E. Conley Stone Co., Utica.
A. B. Caldwell, Genesee Stone Products Co., Batavia.
W. E. Foote, Wickwire Steel Corp., Gasport.
Charles A. Freiberg, Buffalo Cement Co., Ltd., 110 Franklin street, Buffalo.
L. H. Giles, F. E. Conley Stone Co., Perryville.
O. M. Graves, General Crushed Stone Co., Easton, Penn.
A. L. Hocker, Buffalo Crushed Stone Co., Ellicott square, Buffalo.
Grant A. Hunter, F. E. Conley Stone Co., Utica.
J. L. Heimlich, LeRoy Lime and Crushed Stone Co., LeRoy.

George E. Schaefer, secretary

Mr. Johnson, Chaumont Stone Co., Chaumont.
George D. Kittredge, Albany Crushed Stone Co., Albany.
J. Harris Loucks, Albany Crushed Stone Co., Albany.
Harry Lancaster, L. & M. Stone Co., Mayro building, Utica.
W. E. McNasser, Solvay Process Co., Syracuse.
Mr. Mickle, Newport Stone Co., Newport.
Grover J. Murphy, General Crushed Stone Co., Little Falls.
William McGrew, L. & M. Stone Co., Prospect.
C. A. McNall, Albany Crushed Stone Co., Albany.
Mr. Norton, Norton Stone Co., Cobleskill.
J. H. Odenbach, Dolomite Products Co., E. & B. building, Rochester.
Harold Owens, Peerless Quarries Inc., Mann building, Utica.
S. D. Ormsby, Watertown Stone Products Co., Watertown.
F. C. Owens, Rock Cut Stone Co., Auburn.
A. W. Rogers, LeRoy Lime and Crushed Stone Corp., Rochester.
W. L. Sporborg, Rock Cut Stone Co., Union building, Syracuse.
James Savage, Buffalo Crushed Stone Co., Ellicott square, Buffalo.
A. G. Seitz, Rock Cut Stone Co., Union building, Syracuse.
F. W. Schmidt, Sr., Morris County Stone Co., 17 South street, Morristown, N. J.
F. W. Schmidt, Jr., Morris County Stone Co., Morristown, N. J.
George E. Schaefer, General Crushed Stone Co., Cutler building, Rochester.
Newton B. Vanderzee, Albany Crushed Stone Co., Albany.
W. W. Whitmore, C. B. Whitmore Stone Co., Lockport.
R. D. Woolsey, Worlock Stone Co., Canistota.

Alabama Cement Plant

THE Cherokee Rock Asphalt Company of which Dr. Miller Reese Hutchinson is to act as head is building a two mile spur track to its sand stone rock asphalt deposits, which are about that distance southwest of Cherokee, Ala. The company has constructed bunk houses and machine shops and it is said will put in a complete plant which is to represent an investment which will approach half a million dollars. The present pay roll is said to be $4,000 per week and increasing rapidly.

The Alabama Rock Asphalt Company of Florence promoted by C. W. Ashcraft and Tyler Calhoun of Florence, Ala., is getting under way rapidly with its operations at Margerum, six miles west of Cherokee, and has almost completed the installation of drills and construction of a quarry camp. This concern has a rock crushing plant in east Florence, which was used in recent paving work in that city.

Austrian Magnesite Exports

THE exports of Austrian magnesite which were unsatisfactory in 1923 did not prove any better in the first quarter of 1924. Exports still remain below pre-war quantities. In 1923 the exports of magnesite amounted to 87,482.4 metric tons as compared with 133,976.7 metric tons in 1922 (about 120,000 metric tons in 1913.) The United States was again Austria's best magnesite customer in 1923 with 45,543.7 metric tons; England follows with 13,056.7 metric tons, then Germany with 10,077.1 metric tons. In former years Germany purchased far greater quantities of Austrian magnesite (21,617.4 metric tons of sinter and 7,441.7 metric tons of raw magnesite in 1920). The heavy drop in magnesite exports is therefore chiefly due to the smaller German demand. In 1923 magnesite exports to France amounted to 6,764.6 metric tons, to Czechoslovakia 2,182.6 tons, to Belgium 208.9 metric tons, to Italy 1,079.2 metric tons, and to Yugoslavia 1,143 tons. It is worthy of mention that magnesite exports to Spain and Hungary, Peru and India are increasing.

"Sandy" Pratt's New Plant

EVERYBODY on the West Coast knows of "Sandy" (Clarence F.) Pratt from his humorous advertisement in West Coast papers. The business of the Pratt Rock and Gravel Co. and the Pratt Building Material Co., which he has built up by his excellent publicity campaigns, is now one of the strongest on the coast.

In the January 12 issue of ROCK PRODUCTS there was an interesting story of the way Mr. Pratt was raising money for his new plant near Folsom, Calif. His methods were successful and the plant is now producing. The description which follows from the Sacramento (Calif.) *Bee* is of the distributing bins erected in Sacramento.

Plans were announced today by the Pratt Rock and Gravel Co. for the erection of sand bunkers in Sacramento at a cost of approximately $25,000.

Clarence F. Pratt, president of the Pratt Building Material Co., in announcing the plans, said the new bunkers will be the most complete and modern in California. The capacity of the bunkers will be 1500 tons of material, or 30 carloads.

Sand and rock for storage in the bunkers will be shipped by rail from Prattrock, near Folsom. The cars will be run over a concrete pit 21 ft. deep and the material dumped into the pit from the cars. A continuously operating elevator of the automatic type will carry the material 60 ft. into the air where the material will drop into iron chutes for distribution to eight different compartments in the bunkers. A belt conveyor under the bunkers will mix the various grades of sand, rock, and gravel so that trucks can load instantly with any grade of material desired.

The bunkers and retail business of handling the sand and gravel have been leased by the newly formed Ehret Rock and Sand Co. for distribution in the Sacramento territory. Louis D. Ehret of Sacramento is president of this concern.

Because of the modern type of construction to be used, the new sand and gravel plant will be capable of handling from 20 to 30 carloads per day.

The new plant will be adjacent to the Sixteenth street subway and, to make it presentable for the passerby, it is planned to beautify the grounds with trees, shrubs, and flowers.

Cement Men Ask Anti-Dumping Order

THAT the domestic cement industry along the Pacific Coast and in the Southeastern section of the United States is being seriously injured by imports from European countries was contended at a hearing before Assistant Secretary of the Treasury Moss in Washington on June 6.

Evidence was offered tending to show that cement from Norway, Sweden, Belgium and Denmark is being dumped in the United States at prices below the full market value in the countries of manufacture as well as below the domestic cost of production.

It was contended that the domestic industries in these sections are suffering an injury sufficient to warrant the imposition of special anti-dumping duties under the anti-dumping act.

Importers of the foreign cement opposed the issuance of an anti-dumping order. They denied that the domestic industry is being injured to an extent warranting the application of the powers under the anti-dumping act. They pointed out that the total imports represent only a very small percentage of the domestic production. The domestic manufacturers declared that cement is of such a character that a manufacturer finds his market ordinarily in the area immediately adjacent to his plant and that such cement manufacturers as are located near the ports where the foreign cement is coming in are seriously affected by these imports.

H. A. Hayward, of the Custom Bureau of the Treasury Department, in outlining the results of an investigation stated that Norwegian cement manufacturers have sold cement to the United States at prices less than the home market value.

He said that Swedish and German manufacturers had refused to disclose information as to their costs and prices. He indicated that it is doubtful if British manufacturers have made any sale of cement to the United States at prices below the home market value.

Difficulty has been encountered, he said, in obtaining comparisons between home market value and export prices in Denmark. Prices by Belgium manufacturers, he said, have in general been higher in the case of exports to the United States than for home use.

The domestic manufacturers were represented by Jesse P. Crawford of Washington, D. C., and by Joseph N. Teal of Portland, Ore. Representative importers were Joseph Casey of San Francisco, who appeared for importers in that section, and George Puckafer, representing Norwegian manufacturers.—*New York Commercial.*

The plant of the Lee Lime Co., Lee, Mass., burned and rebuilt a few months ago

Eastern Producers See Busy Season Ahead

No Let-Up of Construction This Year, but No One Willing to Predict Conditions Another Season

By Nathan C. Rockwood
Editor-Manager, Rock Products

MY FIRST week in the East, at the annual convention of the National Lime Association, White Sulphur Springs, W. Va., gave me an opportunity to obtain a fairly comprehensive impression of business in the construction field. This may be summarized very briefly. Construction work already under commitment will keep the construction materials industry busy this season. Beyond that no one will hazard a guess.

On the other hand, general business in the East, particularly New England, shows many signs of slackening, including numerous layoffs, wage cuts and a notable increase in unemployment. Consequently, in spite of immigration restrictions, there is an abundance of ordinary labor.

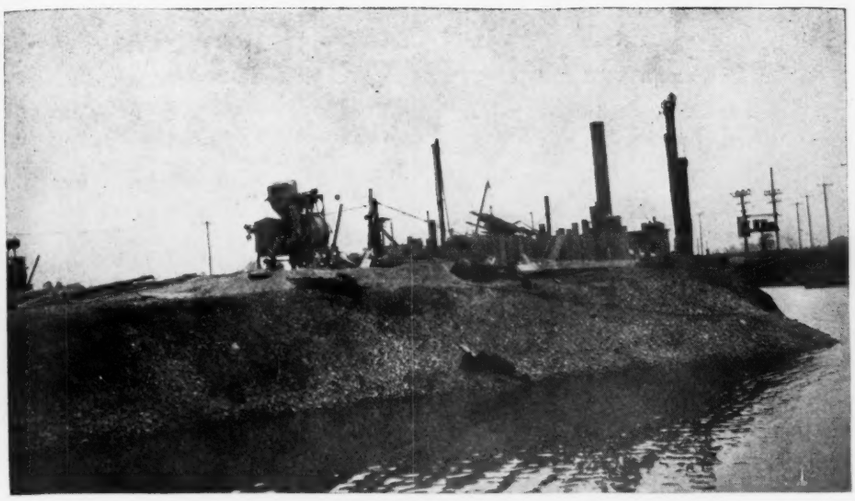
Last year was undoubtedly a very prosperous one for the majority of construction material producers. There must be few indeed whose profits, surplus and credit are not adequate to finance any new production units which may be necessary. There is indeed much activity in the construction of new plants and the improvement of existing plants.

There is, evidently, some danger of an overproduction of lime, which we have commented on at length in our editorial of this issue. A subsequent visit to New York City developed the fact that the lime market there was badly "shot." Competition from some of the smaller producers in Pennsylvania, Maryland and Virginia has led to price-cutting and may end in a serious price war.

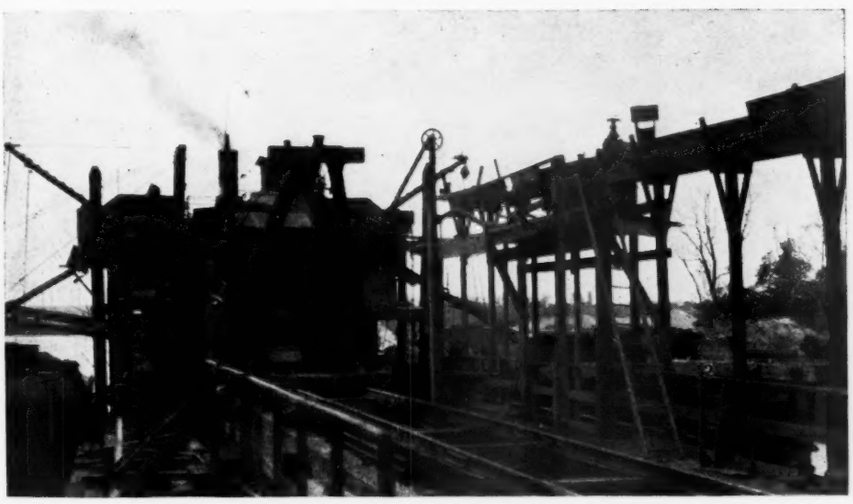
There is also some danger of overproduction in portland cement. One indirect evidence of this was a rumor, subsequently confirmed, of the formation of a new $25,000,000 portland cement company, which will take over four or five now independent producing units. Possibly some of the old heads in the cement industry believe this is a good time to unload. I heard rumors of a similar sentiment among lime men from a certain locality.

In the matter of sand, gravel, crushed stone and slag production, a year of good business seems assured. Only the extreme backwardness of the present construction season has prevented some plants from being swamped with business. With the present stagnant condition of the coal industry an open-top car

J. M. Deely, president of the Tobey Lime Co., West Stockbridge, Mass. (right), and his uncle, Dr. Deely, and his cousin, Deely—all interested in the Lee Lime Co.



Construction work on the new Charles Warner plant at Tullytown



Temporary sand and gravel plant of the Charles Warner Co., Tullytown, Penn., used during construction of new $600,000 plant

New plant of the Keystone Slag Co. at Reading, Penn.

shortage is predicted during the fall months.

Lime Rate Hearing

It was my privilege to attend the first session of a three day's hearing on the general question of lime freight rates, before an examiner of the Interstate Commerce Commission. This hearing grew out of the reopening of the case reported in ROCK PRODUCTS, April 5, 1924, pp. 47, 48, the Lehigh Lime Co. vs. A. C. & Y. et al.

This decision was intended to bring about greater uniformity in rates on lime between Mitchell, Ind., and points in Trunk Line territory, notably Pittsburgh, Penn., and rates on lime from the Martinsburg and Harper's Ferry district of West Virginia, Maryland and Pennsylvania. The rates from the East to Pittsburgh territory have always been appreciably less than rates from competitive points in the Central West to the Pittsburgh territory.

The effect of the decision was to lower rates from Mitchell and raise rates from certain Eastern points. Eventually, if the principle is upheld there will be a general equalization of rates which will tend to shift more of the Pittsburgh territory business to Central West lime plants. Consequently the reopening and arguing of the case is a matter of very general interest to a large part of the lime industry.

It developed at the hearing that there is a great variety of rates on lime from certain Eastern points to Pittsburgh territory according to whether the lime is classified as chemical lime, fluxing lime, building lime, finishing lime, agricultural lime, etc.; and while the rate on certain classifications were raised in accordance with the I. C. C. decision, they were not raised on such commodities as "fluxing lime."

It was therefore up to the I. C. C. and the railways to determine the differences between some dozen or more varieties of lime—all quarried from the same quarry and all burned in the same kilns. Certain parts of the testimony were quite amusing to lime manufacturers and other initiated spectators—the definition of agricultural lime, for instance, as a lime containing impurities not allowable in chemical lime. This led to the frequent use of the term "dirty" lime by the railway representatives and the inference that a lime manufacturer might justify lower rates on his "dirty" lime product, if he chose so to define it!

My understanding is that the hearing continued for three days, the chief point to be proved being that these different rates are justified on different kinds of lime. Knowing the haziness of experts on these different classifications one can readily conceive of the clearness with

which the I. C. C. examiners and the railway traffic men comprehended what it was all about. The new decision will be awaited with interest.

New Plants

A visit to new sand and gravel plant under construction by the Charles Warner Co. at Tullytown, Penn., proved of much interest, for this plant is to be not only one of the largest in the East but because of its operating features, one of the most notable. Irving Warner is designing it with an open mind and not hedged in by precedent. Later, when it is completed, we are sure our readers will find a description of it of much interest.

The Lee Lime Co., Lee, Mass., has rebuilt its hydrating plant which was destroyed by fire last winter. The method of collecting a superfine hydrate at this plant is quite interesting and will be described in a later issue. This is one of the Deely plants

At West Stockbridge, Mass., the Tobey Lime Co., of which J. M. Deely (Jack) is president, has just put in operation a rotary kiln lime plant that surpasses in value received for the investment any similar plant the writer has ever seen. It has operated without the slightest hitch since the wheels were first turned over. We shall have a complete story on this plant in an early issue.

Another interesting development in New England is the increasing investment in crushed-stone service bins in some of the principal market centers. A special type of bin has been developed for this service.

At Reading, Penn., the Keystone Slag Co. has replaced a plant destroyed by fire last February, with one of the prettiest and most efficient slag plants to be found anywhere. Joseph B. R. Hunter, one of the pioneer slag producers of the country, is justly proud of his new baby and claims to make a roofing slag second to none in this country—one that is in demand in a score of states. This plant we shall also describe in an early issue.

Growing Use of Structural Steel Built Plants

The Tobey Lime Co. and Keystone Slag Co. plants, built entirely of structural steel, concrete and corrugated iron siding, represent a type of construction that is fast becoming standard in the rock products industry. The fire loss in rock products plants has always been heavy. Nearly every week we record the loss of one or more crushing plants by fire. While the writer was East he learned of the recent destruction of the New York Trap Rock Co.'s Verplanck plant by fire and the plans for immediate reconstruction in fireproof structural steel. The new plant of the Bound Brook Crushed Stone Co., Bound Brook, N. J., replacing the plant destroyed by fire last winter, went into production June 4. This, I believe, is of the structural steel type.

National Sand and Gravel Association Asks Change in Car Demurrage Rules

AT A MEETING of the American Railway Association committee on demurrage, storage, reconsignment and diversion, held in Chicago on June 12, the National Sand & Gravel Association formally asked that the national car rules be amended. The National Sand & Gravel Association desires the establishment of demurrage rules on the use of open top cars which will apply alike to sand, gravel, crushed stone, or coal. The hearing before the carriers' committee was a step preliminary to filing a formal complaint with the Interstate Commerce Commission.

The National Sand & Gravel Association was represented by F. W. Renwick, Chicago; T. E. McGrath, Lincoln, Ill.; T. R. Barrows, executive secretary of the National Association, Washington.

This action of the association carries out one of the recommendations passed at the national convention held at St. Louis, as a part of the association's program for the coming year. The resolution read: "That the coal industry should be placed on the same basis as the sand and gravel industry with respect to the payment of demurrage charges and also with respect to reconsigning privileges."

Death of H. A. Major

H. A. MAJOR, head of the lime and limestone department of the Chief Consolidated Mining Co., Salt Lake City, Utah, died in Salt Lake City on May 25. Mr. Major will be remembered by many quarrymen who attended the annual convention of the National Crushed Stone Association at Chicago in 1923. Under his supervision the Chief Consolidated Mining Co. has recently built and put into operation a new lime plant.

Mr. Major was 41 years of age and had been with the Chief Consolidated Mining Co. since February, 1922. Prior to that he was with the Utah-Idaho Sugar Co., as superintendent of their plant at Spanish Fork, Utah.

Death of William B. Shaffer

WILLIAM B. SHAFFER, a pioneer in the portland cement industry in the United States, and who had been connected with a number of companies, died at his home in Nazareth, Pa., on May 25. He was 72 years old and had been ill for five years, the last two years so seriously as to be confined to his bed.

Mr. Shaffer was born in Macungie township, Pa., and afterwards resided in Allentown. He was a charter member of Salem Reformed church, in this city, and superintendent of its Sunday school for 21 years. When he left Allentown, Mr. Shaffer became interested in cement manufacturing. He was promoter of the old Nazareth Portland Cement Co. in 1895. Later he developed the Nazareth Dexter Cement Co., and then he promoted the Phoenix Cement Co. He subsequently moved to Martin's Creek and became interested in the Superior Portland Cement Co., and when this was sold to the Alpha Portland Cement Co., he went to Alabama to develop a tract known as the Coosa Portland Cement Co.

Mr. Shaffer was a member of St. John's Reformed church, Nazareth. He belonged to Masonic bodies.

Plaster Mill of Pacific Portland Cement Co. at Gerlach, Nev.

THE new plaster mill of the Pacific Portland Cement Co., at Gerlach, Nev., began operations in the latter part of May. This plant is one of the most modern in the United States, and it will produce not only wall plaster but gypsum tile and blocks, wall board, Keene's cement and other gypsum products.

All the mill buildings are of structural steel covered with galvanized corrugated steel and all floors are of concrete. The grinding plant has six 5-roller Raymond mills and the calciming department has six kettles. The company has built its own hydroelectric plant and as the entire operation is situated on the Nevada desert, it has been compelled to build a complete town for the housing of its employes, with office buildings, hotel, club house, etc.

ROCK PRODUCTS has in preparation a full description of this plant which will appear in an early issue.

School Districts Fight for Valuable Quarry Property

BETTSVILLE and the Cromers school district, both north of Tiffin, Ohio, have opened a fight over the valuable strip of territory in which Maple Grove is located. The strip includes stone quarries and property of the Dolomite Products Co. The valuation is more than $1,000,000. The territory now belongs to the Cromers district and as a result the tax rate is the lowest in the county. Bettsville is seeking the annexation of Maple Grove in order to centralize.—*Toledo (Ohio) Blade.*

New York Trap Rock Co.'s Plant Burned

THE Verplanck plant of the New York Trap Rock Co., just below Peeksville, N. Y., on the Hudson River, was recently destroyed by fire. It will be replaced with a very modern steel plant to be erected by the Wilbur G. Hudson Co., engineers and contractors, 50 Church St., New York City.

British Lime Manufacturer Makes Many Friends

MAJ. C. W. D. ROWE, managing director, the Dunstable Lime Co., Ltd., Petersborough, England, who has been visiting American lime plants and was a guest of honor at the White Sulphur Springs convention of the National Lime Association, has returned to his home leaving a host of friends in this country. The major was beloved by all who had the privilege of meeting him—and they were many, both ladies and gentlemen.

Maj. C. W. D. Rowe

He proved a "regular fellow" in every sense of the term.

Speaking informally before the lime convention, Major Rowe gave some very interesting details of the lime industry in England and of trade association activities there. Among other things he said:

The English lime industry as a whole lacks that which the National Lime Association shows that your own industry possesses to a very high degree—co-operation. We have several associations of lime manufacturers, but we have not, as yet, a national body working for the industry as a whole. One reason for this is, I think, the very large number of types of lime that we have, ranging from 99% high-calcium chemical limes to limes which are practically natural cement, and the fact that as hydraulic lime materials are so abundant, a very sharp distinction is made between chemical limes and mortar limes. Some degree of hydraulicity is insisted upon for building purposes (except finishing lime), although, of course, the high-calcium lime manufacturers are always endeavoring to get a foothold into the building trade.

My own company produces a building lime known as greystone, burnt from the grey or lower chalk, which gives a lime containing about 84% CaO and 14% silica and alumina. It has definite hydraulic properties, yet has the easy-working properties of a high calcium lime.

The radical difference between our trade associations and your own is that, with the exception of those formed especially for research such as the Glass Association, ours exist primarily for the purpose of securing a fair price for the product by fixing a scheduled price.

Our experience goes to show that our trade associations protect the consumer as well as the manufacturer. Public opinion ensures that the price is a fair one and the result is that in times of bad trade, the industry is stabilized and not cut to pieces; and in times of trade boom, the consumer is protected because our retailers must not only not go below the scheduled price, but they must not sell above.

Your competition in the building industry comes from gypsum, but with us it is portland cement. There is a growing tendency to use straight cement mortars except where cost is a consideration, and then straight lime mortars are employed. Our cements must, I think, be easier working than your own, although I hope that there is still room for the use of hydrated lime in concrete.

In plastering, your conditions seem to be reverse of ours. I find you using gypsum plasters for cheapness, while with us patent plasters are used for the finishing of the best work, the rough coat being usually of grey lime. If cost is an important consideration, finishing lime is used. Here again our patent plasters must be more easily worked than yours. Both of these conditions mean that the prices of our mortar and finishing lines must always be kept well under that of portland cement and the patent plasters.

Lime Manufacturing in England

Hydration is only just making headway for building limes. We have been going warily because general hydration tends, I think, to smooth out the differences in types of lime. The question of getting a higher CaO content in the hydrate is very interesting to me, as, if we can get rid of some of our silica and alumina content by hydration, it means that my firm can tackle the chemical demand. As far as we have gone, however, the silica and alumina seem to be in too intimate association ,a point we claim for our mortar lime.

The common type of kiln is the direct feed shaft employing coke. Coke is now, however, far from being the byproduct that it was before the war, and is becoming more expensive than coal, so that gas kilns will become more general. We have an excellent gas kiln in the Priest, which by employing preheating and waste heat boilers obtains a fuel ratio of 6 and sometimes nearly 7 to 1.

More Attention to Labor-Saving

With our greatly increased labor costs, we are having to give much more thought to labor-saving equipment. In our labor, we are more fortunate, I think, than you are. The cost is nearly double what it was before the war, but our labor has come to realize that there is a limit to what can be taken out of industries in wages, and that it is an easy matter to kill the industrial goose that lays the wage egg. Practically all of our industries make six-monthly agreements with the workers' representative based upon the government cost-of-living figure, and the operators are always ready to look at the manufacturers' side of the question.

These represent the chief points of comparison which I have so far noticed. I must, however, take this opportunity of expressing my gratitude for the very great kindness that has been shown me. Nothing that could make my visit more interesting or more pleasant has been too much trouble. I shall go back, not only with a very greatly increased knowledge of lime manufacture and a valuable addition to my business education, but also with the very warmest remembrances of that more personal order which make life so pleasant.

On "American Hustle"

The major proved a keen observer of things American—both in the lime industry and out of it. He humorously observed at the luncheon table one day: "There is one thing about this American hustle I do not understand. I can't understand why you spend 15 minutes standing in your boots to have them polished."

H. D. Pratt, Consulting Engineer

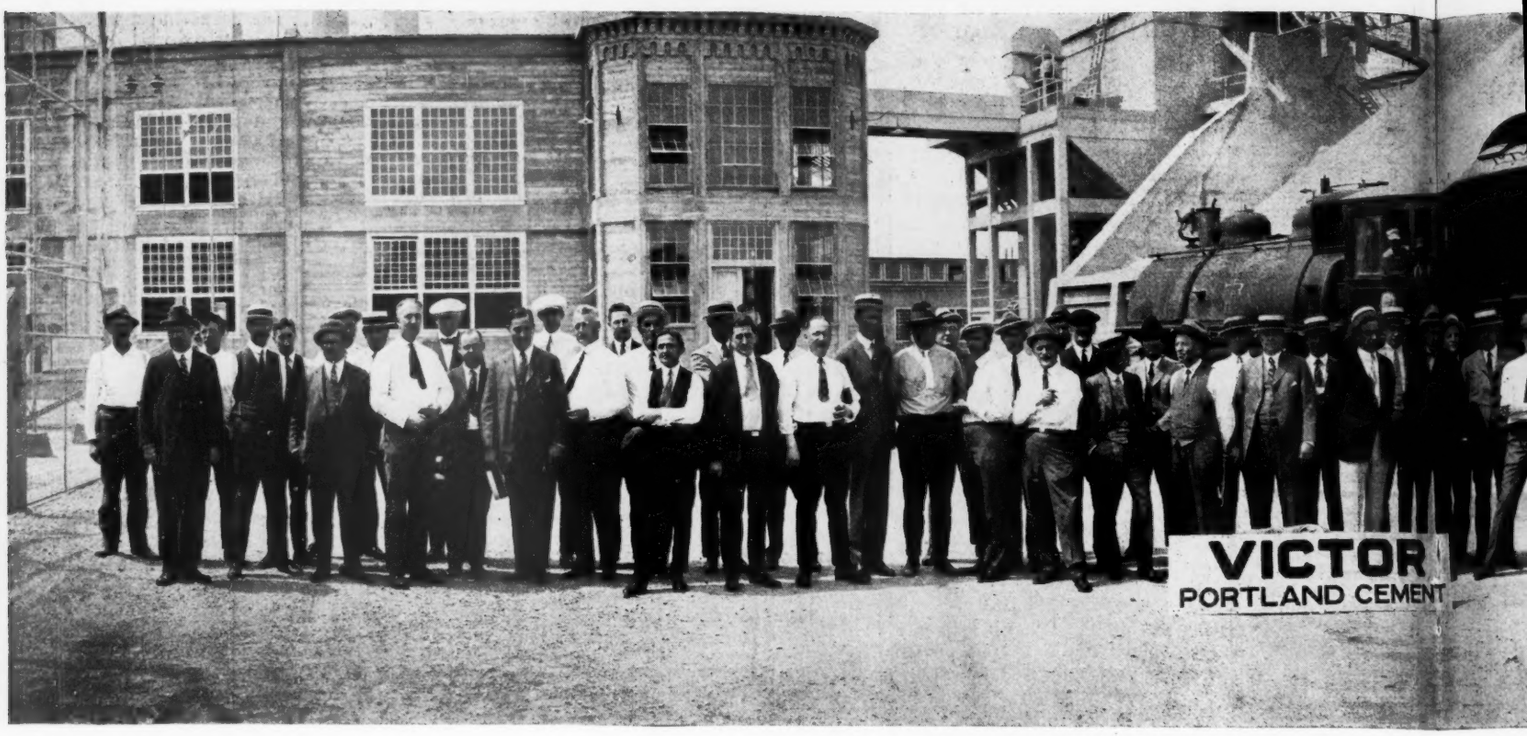
HOWELL D. PRATT, whose services to the lime and sand and gravel industries as a sales engineer of the Link-Belt Co., Philadelphia, are too well known to rehearse here, has formed such connections that his services are now available as a consulting and designing engineer for the erection of complete plants for the production of lime, sand, gravel, crushed stone and slag.

Mr. Pratt is a graduate engineer of Cornell University and has had a wide

H. D. Pratt

experience in the design and erection of plants and equipment for handling sand, gravel, crushed stone, lime, cement, slate, gypsum, coal and similar materials. His latest work in the rock products industry was the design and supervision of construction of the Tobey Lime Co. plant at West Stockbridge, Mass.

His address is Room 980, 50 Church street, New York City.



Those who visited the Victor Portland Cement plant at the outing following the sprin

Carl Leonardt Entertains Delegates to the Portland Cement Association Meeting

By George P. Miller

AFTER the spring meeting of the Portland Cement Association, which was held in Los Angeles, May 19 to 21, Carl Leonardt, president of the Southwestern Portland Cement Co., was host to a number of the delegates at an excursion to his company's plant at Victorville. The trip was managed by F. H. Powell, sales manager for the Southwestern. A special train carried the party to the plant and good food and everything else that goes to make such a party a success was generously provided.

The Victorville plant of the Southwestern Portland Cement Co. (at Victorville, Calif.) was started seven years ago. At that time the production was 1000 bbl. per day and now, with completion of their latest addition, the production is 5000 bbl. per day. It is generally conceded that this wet process plant is one of the model plants of the industry.

The members of the association that visited the plant were emphatic in their praise for the plant's design, construction and the cleanliness that marks the plant and the grounds around it.

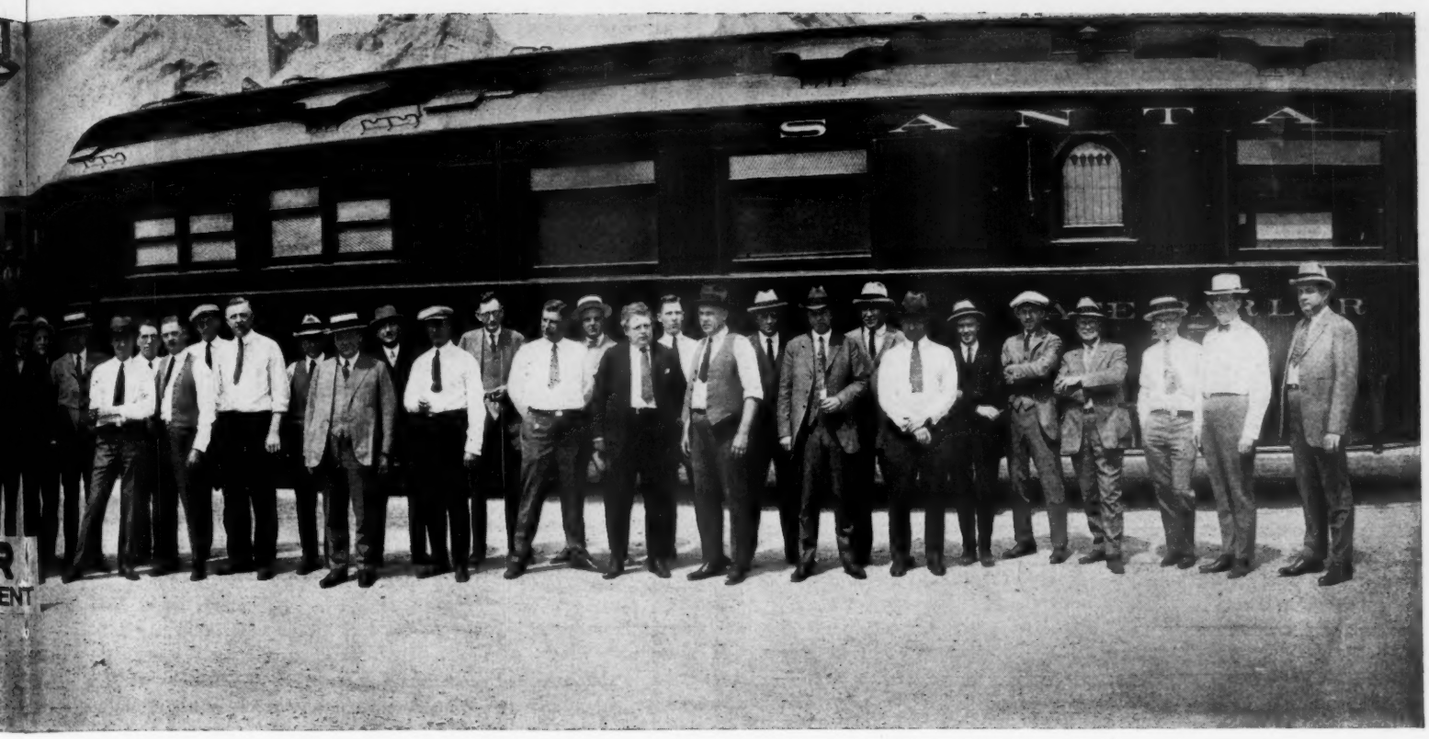
"Cleanliness and order," stated F. H. Powell, the salesmanager of the company, "are passions with Mr. Leonardt, our president, and it was a great pleasure to us in taking the members of the association through the plant to have them note that they were not covered with dust."

The company now operates two plants, one at Victorville and one at El Paso, and is building one at Dayton, Ohio. The Dayton plant will be completed by January 1, 1925. Mr. Leonardt is spending his time at the new plant while it is under construction.

Those who were guests on this occasion and who appear in the picture above are:

H. P. Anewalt, Los Angeles; J. C. Allen, Pasadena; Ernest Ashton, Allentown, Pa.; B. F. Affleck, Chicago.

From left to right: William Kinney, J. B. John, B. F. Affleck, F. W. Kelley, John L. A. Galster, Marshall Beck, W. E. Keller, F. H. Powell



wing the spring meeting of the Portland Cement Association at Los Angeles

J. O. Bacon, Garner A. Beckett, F. A. Ballin, Los Angeles; L. T. Bachman, San Francisco; Marshall Beck, Indianapolis.

F. P. Cruice, Joe Costello, Los Angeles; R. R. Coghlan, El Paso.

H. C. Dickson, Samuel H. Deyot, Los Angeles; H. H. Dubendorf, Long Beach, Calif.

A. D. Farger, Los Angeles.

John L. A. Galster, Petoskey, Mich.

Claude A. Harlow, Los Angeles; W. E. Hart, Chicago; Frederick Huber, Riverside, Calif.

J. W. Johnston, H. G. Jacobson, J. E. Jellick, Frank H. Jackson, J. H. Jaffrey, Los Angeles; J. B. John, Newago, Mich.

F. W. Kelley, Albany, N. Y.; Will E. Keller and John P. Kremple, Los Angeles; A. F. Krabbe, Bellingham, Wash.; William Kinney, Chicago.

W. H. Leonard, C. A. Low, T. R. Larson, Los Angeles; David H. Leche, Oswego, Ore.

K. I. Marshall, F. S. Moon, Jr., C. C. Merrill, F. S. McGinnis, Los Angeles; E. J. Maguire, Cleveland, Ohio.

H. E. Nichols, El Paso.

F. H. Powell, T. K. Partridge, Los Angeles.

Joseph Riordan, San Francisco; Chester N. Reitze, Seattle; F. T. Rice, P. D. Rowan, Los Angeles.

R. G. Schirm, Los Angeles; H. A. Schaffer, Chicago; H. C. Swearingen, El Paso.

O. C. Tretten, San Francisco; R. R. Templeton, Los Angeles; W. E. Tyler, Kansas City.

F. T. Van Dierman, Alhambra, Calif.

The guests enjoying an informal banquet near the plant

Wash Out Overburden Rather Than Strip Sand and Gravel Deposit

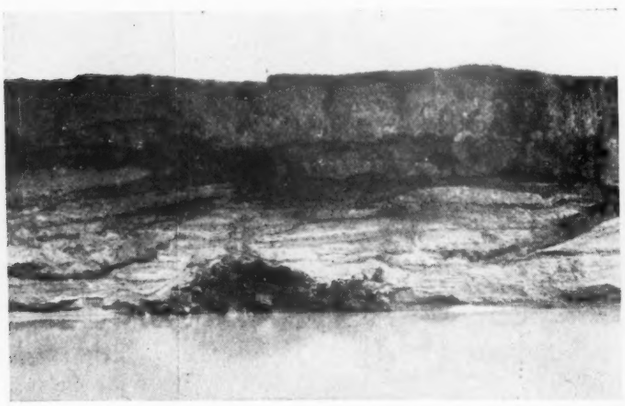
Wolf River Sand Company of Memphis Adopts Washing Method After Trying Stripping—Combination Cable Excavator and Dredge Operation

AN economic problem that worries almost every producer of sand and gravel is that of disposing of the overburden or stripping. Whether it is cheaper to strip the deposit and "side cast" the overburden or to dig the deposit as a whole and wash out the overburden along with whatever clay and dirt may be in the voids, is a question that has to be answered strictly according to the local conditions. In the case of the Wolf River Sand Co. of Memphis, Tenn., the final answer has been that it is cheaper to wash out the overburden, but this decision was not reached until the company had tried both ways.

Originally the deposit, which is fairly deep and lies mostly under water, was worked with a Sauerman dragline cable excavator with a 1½-yd. bucket. Operations were carried on with this machine until the span to be traversed by the bucket grew too long, so that the plant had to be moved or another method had to be chosen.

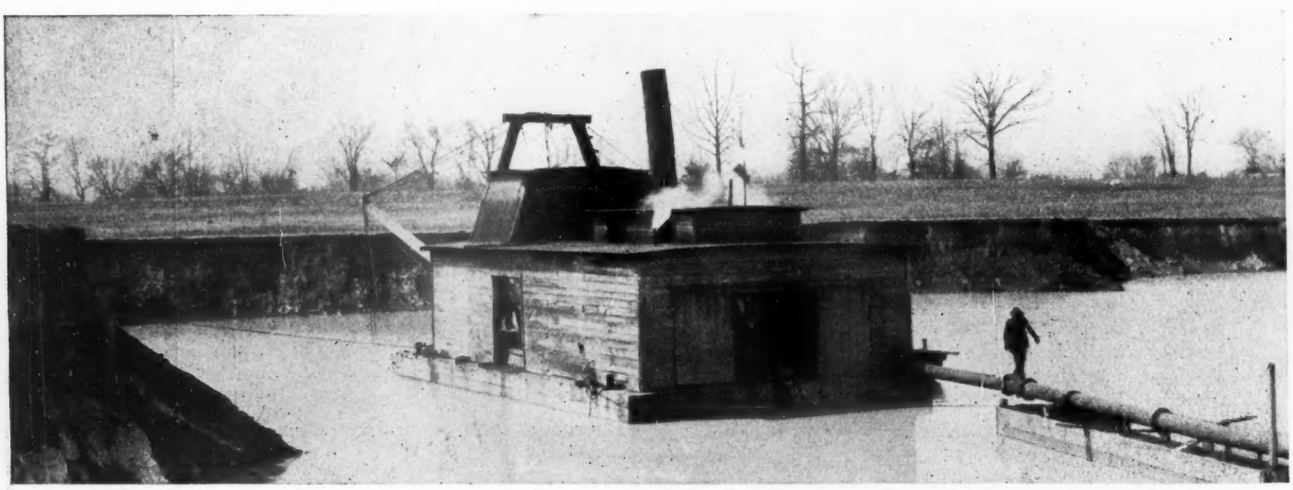
For various reasons it was determined to try another method, which would have a longer radius of action, and the choice fell on a dredge pumping through a pontoon line. This line had to be long to reach the plant and in addition the material had to be lifted 75 ft. in the air to get it to the hopper above the screens. This made a rather heavy lift for the pump. It was thought better to pump to the dragline and use the dragline to elevate the material to the plant.

The deposit has an overburden varying from 3 to 6 ft. in depth of what is locally called clay, but which is probably loëss, or wind-blown dirt, such as all the hills about Memphis are made of. The picture of the bank shows the dark overburden above the white sand and also the clay streaks in the sand. The sand goes below the water line some 35 ft.; and below it is a clay bottom, a part of which is sometimes pumped with the lower stratum of sand. So there is fully

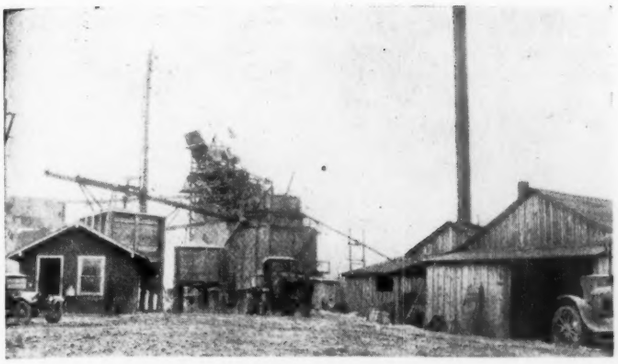


Face of bank—note 3 ft. of overburden and "clay" seams

Pond from which dragline reclaims the pumped material

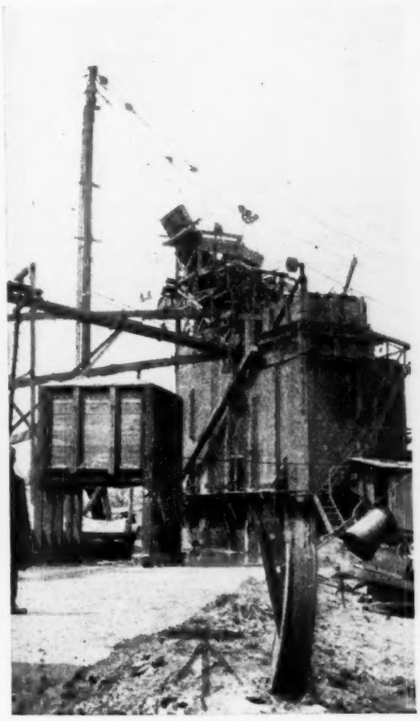


The 12-in. pump dredge that excavates the material and delivers it to a pond from which it is lifted to the plant hopper by a dragline, thus giving the material two washings

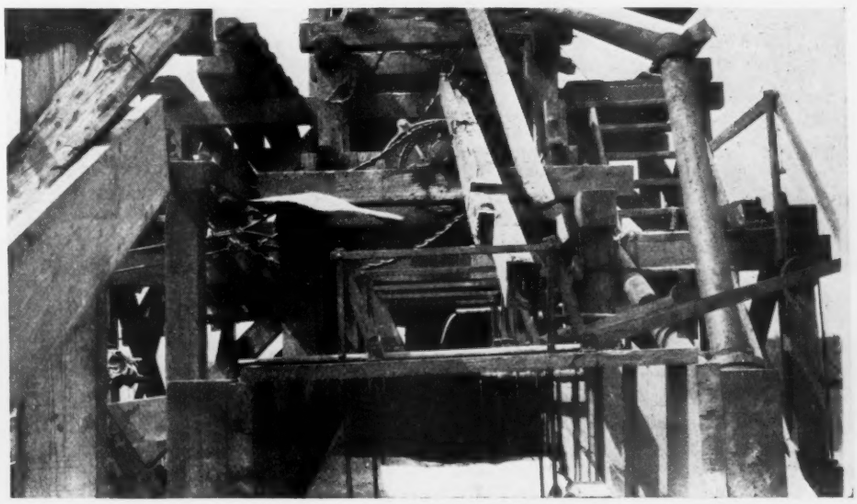


Yard and bins for loading into trucks

New concrete brick plant of Wolf River Sand Co.



Washing plant and loading bin



Screens and sand boxes, the latter designed and built at the plant

as much clay to contend with as is usually found in sand deposits.

At the beginning of operations in this pond the deposit was stripped by a steam shovel and about 40,000 yd. were taken off in this way. The disposal of so much waste proved a serious matter and it was decided to dig the bank as a whole and wash out the overburden.

This method has worked well, but it would not have worked well if it had been tried with a single washing. But pumping the material into the old lake and then excavating it by the dragline gave it a rough preliminary wash so that the plant was able to remove the remainder of the clay and turn out a very clean product. The sand is almost pure silica and is practically white after it leaves the washer.

The dredge is steam driven, coal being used as fuel. The pump is a 12-in. Morris and the discharge is through a pontoon line that is practically flat. At the discharge end of this line is a baffle for breaking up clay balls.

Care is taken not to accumulate too much material for the dragline to handle, so that the greater part of the lake is deep water in which the clay can settle. The agitation caused by the pump and the dragline bucket is enough to keep the clay from settling with the sand. Occasionally when the overburden has been very heavy the sand has been excavated and then allowed to run back into the lake by gravity to be later excavated again by the dragline. In this way a clean product may be made from the dirtiest material encountered.

The plant contains two Gilbert screens, made by the Stephens-Adamson Manufacturing Co. Only two sizes of gravel are made, 2-in. and ¾-in., as is the regular practice in the Memphis field. The gravel is a small part of the production, about three cars in every twenty loaded.

Only one size of sand is made and this is caught in settling boxes of the company's own design. These boxes are not automatic, discharge being through valves operated by hand. One set of these boxes is immediately below the screen and another set is placed above a stock pile behind the plant. One man can attend to the screens and to discharging the sand boxes quite easily.

The same company operates a plant in Arkansas for gravel and it also buys gravel from plants in Alabama and Mississippi.

V. A. Cordes and E. Cordes are president and vice-president of the Wolf River Sand Co. and W. A. Bridewall is secretary-treasurer. Thomas Griffiths is in charge of the plant operations.

Recently a concrete brick plant has been opened by the company employing one Helm machine. The plant has only a small capacity but the business is increasing and additions will soon be made.

The sand has been tested and found satisfactory for refractory and steel molding purposes but there is no market for it at present for these purposes.

Gravel Plant Employe Saved by Falling on a Belt

A MACHINERY belt probably saved the life of Jack Riner, Independent Gravel Co. plant employe at Carthage, Mo., when he slipped on a scaffolding while doing some repair work and fell 40 ft. He struck across a big machinery belt, which threw him again into the air, he next lighting on his head on the ground. A severe scalp wound today appeared to be his most serious injury, although his body was bruised and sore.—*Webb City (Mo.) Sentinel.*

Missouri's Twenty Cent Sand

Sand and Gravel Experts Inspect and Report for National Association

THE effect of the broadcasting of the "twenty-cent sand" story by the chief highway engineer of Missouri has been to arouse the sand and gravel producers all over the United States. The *National Sand and Gravel Bulletin,* which is the official journal of the National Sand and Gravel Association, quite naturally denounced the methods of the Missouri Highway Commission in this connection. B. H. Piepmier, the chief highway engineer, took exceptions to the *Bulletin* article and asked Executive Secretary T. R. Barrows of the association to make a full investigation.

Secretary Barrows called on J. L. Shiely, of the J. L. Shiely Co., St. Paul, and Hugh Haddow, Jr., of the Menantico Sand and Gravel Co., Millville, N. J., to assist in this investigation. These men are not only members of the executive committee of the association but are nationally known and by their long experience in the sand and gravel business they are probably as well qualified as anyone who could have been chosen to make such a report. Furthermore, they are men of such high reputation and standing that the accuracy of their report would be unquestioned.

The full text of the report follows:

The Report

"Reconstructing the actual cost to the state of this 'twenty-cent' sand, on basis of delivery at destination, we find that:

"The material is not suitable for one-course concrete pavement;

"It contains sticks, trash, large pieces of lignite and silt;

"It requires washing and screening before it is fit for use.

"This operation of 100,000 tons, to be used during a period of two years, makes necessary the erection of a washing and screening plant of 500 tons daily capacity, at a cost, after salvage has been deducted, of $25,000, or—

Plant cost, per ton	$0.25
Somebody is paying for truck	.03
Somebody is paying for depreciation of crane that is to be furnished	.05
Royalty to State of Kansas	.012
Operating cost: plant and crane, labor, repairs, oil, grease, insurance	.165
Contract price with Woods Bros. for sand pumped on bank of river	.20
Freight differential; the average freight differential existing as between state and interstate rates to stations in Missouri approximate, on sand, per ton	.30
Total cost	$1.007

"This without any profit.

"There will be a waste of approximately 10% in the above operation by reason of the silt and other unsuitable material it now contains. Therefore, if 100,000 tons are pumped on the bank of the river, only 90,000 tons can be shipped.

"Signed: J. L. Shiely,
"Hugh Haddow, Jr."

In the May 31 issue of Rock Products was given the result of an investigation of this sand deal by one of the editors. It will be noted that the report quoted above gives a higher figure as the cost of the sand to the state than was figured in Rock Products' investigation. In the report made by this paper it was expressly stated that the cost of certain items had not been included in the estimate of total cost; the sand was to be used as is. Mr. Shiely and Mr. Haddow have included the cost of such items as washing and screening the sand and hence their estimate of total cost is increased.

Rochester, N. Y., Sand and Gravel Plant Sold

ACCORDING to the Rochester, N. Y., *American,* the Consolidated Materials Corp., of Rochester, has recently taken over the entire plant, equipment and sand and gravel deposits of the Continental Products Corp. The purchase includes about 300 acres of deposits of sand and gravel on three railway lines. It also gives to the Consolidated Materials Corp. the Continental's Lehigh Valley railroad terminal at Mt. Hope avenue. From this city distribution point, quick truck deliveries of the finished raw materials can be made to construction jobs, as designated by the contractor. The immediate installation of a new electric shovel with a capacity of 1500 tons per day will increase the output of the plant about 100% over its past capacity.

Alabama Sand and Gravel Rates Reduced

NEW and reduced rates on sand and gravel, which will apply to an immense movement of these two materials for building the dam of the Alabama Power Co. at Tallahassee, were decided upon by agreement, without formal hearing of cases docketed before the Alabama Public Service Commission. There were two cases pending comprising petitions by the Western Railway of Alabama relative to gravel and sand rates, and a petition of the Roquemore Sand and Gravel Co. attacking certain of the Western's and Birmingham and Southern railway rates on the articles. By agreement there will be established a rate of 6 cents on sand and gravel from Cook, Arrowhead, Mt. Meigs, Rice, Cheehaw and Montgomery to Tallassee and the same rate of 65 cents from all of the points except Montgomery to Asberry, the rate from Montgomery to Asberry to be 75 cents. The Western had asked for rates of 75 and 79 cents instead of these which were decided on. It was stated that six to seven thousand carloads of sand and gravel will benefit by the rates thus reduced.

In another case the Public Service Commission granted the Central of Georgia a reduction in its sand and gravel rate from Montgomery to Troy to 75 cents per ton, to meet competition from the Atlantic Coast Line railroad, whose rate had been previously reduced to 75 cents by the commission. —*Birmingham Age-Herald.*

Find Skeletons in Gravel Pits

WHILE opening a gravel pit along the Mississinewa river, near the MacBeth-Evans factory, Gas City, Ind., the workmen found the bones of a human body, at about a foot below the surface, the bones of the knees being placed up near the skull, showing evidence of foul play. The bones had been in the ground so long that identification of the body was impossible.—*Gas City (Ind.) Journal.*

A crew of men working for C. M. Stevens, state road contractor, were excavating in a gravel bank a mile east of River Bend. At a depth of about 4 ft. the men encountered something that was bulkier than the gravel they had been shoveling. Upon investigation it was found to be a human skeleton. The fact that it was an Indian skeleton was disclosed by a string of Indian beads around the neck, the skeleton being in a sitting position.—*Simon (Colo.) Lead.*

New Southern California Rock and Gravel Plant

THE San Fernando Rock and Gravel Co. has been organized and is preparing to erect and operate a modern rock-crushing plant on a 10-acre tract on Osborne avenue, San Fernando, Calif. The machinery is said to have been purchased and the contract awarded for the erection of the superstructure. Building operations will be rushed that the enterprise may be put in operation at the earliest possible date.

At the outset it is planned to have an output of sixty 24,000-lb. truck loads of crushed rock and sand daily. Practically all of this will be hauled south to Los Angeles.

A. D. Amstutz will be in charge of the plant. Acting with him on the board of directors of the corporation are C. E. King, Charles Cox, M. L. Alexander, and Clyde R. Moody.—*Los Angeles Times.*

Gravel Plants Call for More Power

A NEW automatic sub-station of the type adopted by the Public Service Co. in a number of plants of the character is under construction near the Rock Island tracks at the north edge of Chillicothe, Ill. It is called for by the large increase in power demand here originating chiefly in the sand and gravel industry. The McGrath Sand & Gravel Co. has multiplied its requirement heavily.—*Chillicothe (Ill.) Bulletin.*

Missouri State Highway Department's Contract for Crushed Stone

R. Newton McDowell, President of the Consolidated Crushed Stone Co., Explains Some Hitherto Unpublished Features of His Contract

REFERRING to the article in ROCK PRODUCTS, May 17, 1924, page 51, dealing with certain road material contracts made by the Missouri State Highway Commission, R. Newton McDowell, president of the Consolidated Crushed Stone Co., Kansas City, Mo., one of the factors in the present controversy, has this to say:

Mr. McDowell's Letter

"Missouri—with its bond issue and other appropriations—embarked on a hundred million dollar road building program. I was in the security business and not the material business, but I did know crushed stone was required to build roads. There are two quarries in Kansas City on a railroad, with a combined production of approximately 200,000 tons per annum, all of which was being used for commercial purposes. Going north from Kansas City, at Plattsburg, was another quarry producing 2 or 3 cars a day. You then jump over the northern part of the state 300 miles to Hannibal, before you find stone of any character or description. And there, only the surplus from lime plants. Going across the state from Kansas City to St. Louis, another 300 mile stretch, you find one small quarry at Blackwater producing about 5 cars a day, and further on, nearer St. Louis at Aux Vasse, another quarry working now and then producing about 5 cars a day. The above small production was to supply two-thirds of the state. And, mind you, these quarries had been surviving for some years on commercial business, before we ever had a road program. You will appreciate to draw on this small production to meet the needs of a large road building program would be impossible and meant one of two things would have to be done—either the state of Missouri or some private parties would have to build some large quarries or the State of Missouri would not be able to build very many miles of roads. And I might add here, some more large quarries will have to be built if Missouri is going to carry on its program with any degree of speed.

"I didn't imagine this condition, and no one took me up a dark alley and whispered this into my ear; because it was very evident, when road contracts on a very small scale were being closed down due to the lack of stone. What then—I said to myself—would happen when Missouri really got started paving roads. I began to look for stone, and was quite surprised to find how little stone of the right sort in quality and quantity was available in Missouri. I had six men out for weeks going over county after county and I, myself, was in 66 counties in the State last year. I talked and thought nothing else for some eighteen months. I believe I bothered you a few times on the subject. To make a long story short, I gained control of some 14 properties, which I thought would make good quarries, situated in different parts of the state (the two thirds I referred to).

Introduced the Subject to the Highway Commission

"I explained to the Highway Commission the situation as I found it. That was in January 1923, and I might insert here that I didn't know nor had I ever met any member of the Highway Commission until I introduced myself and subject. I had figured out that it would require about five large sized quarries, at different points in the state, to supply the Highway needs—giving account to freight hauls. I estimated to properly equip these quarries would require $1,100,000. To secure that sum of money on a rock quarry, I knew would be difficult, as I did claim to know something about the security business if I didn't know anything about the rock business.

"The Highway Commission believed that if a man or corporation had a contract running for a period of years with the State of Missouri to furnish stone, sand, gravel, etc., that he could use this contract as a basis of financing, and thereby enable him to develop a much needed industry in Missouri, necessary to a road-building program. It either meant something of this sort or state-operated quarries. And the Commission were opposed to the latter. So, accordingly, in June 1923, they voted to ask for bids on materials. A set of specifications was drawn up, and, as this was rather a new procedure, it was difficult to get up a set of specifications to cover all possible conditions. So the Commission advertised for bids, in all counties in the state, stating in this advertisement that, a subsequent agreement could be made with any bidder. Anyone had an opportunity to bid on material requirements for one county, any combination of counties, for either one year, three, or five years' supply. In other words, the door was left wide open for both the small and large operator.

"I placed a bid on the total requirements. I had provided capital to the extent of $1,100,000 with a nationally known banking house, with headquarters in Chicago. I arranged for a proper surety bond. All of these arrangements were made as if and when I should receive a contract from the State of Missouri. I attended the letting, put up my cashier's check as was required to back up my bid.

No Other Bidding

"The three quarry men, who were before the commission recently, to complain about my contract were in Jefferson City at this letting, and sat as spectators without placing a bid and sort of sneering at the whole procedure, and freely passing the remark "Nothing will ever come of it, anyway." A few small operators did bid on furnishing one county here and another there and the Commission accepted and awarded a few small contracts in the southwestern portion of the state as a result of this letting. I might mention here that the law does not require the Commission to advertise for bids for material. They have a perfect, legal right to buy their material any place and in any fashion they see fit.

"My bid and all of my arrangements were made on the assumption that the Commission would be able to sell fifteen million dollars in bonds a year, and thereby carry on quite a program. But, due to a shortage in income, the Highway Department was faced with the possibility of only having five million dollars a year in bonds to sell, and they hesitated to contract for as much material as my bid called for with the limited funds available.

"The chief engineer of the department began cutting the quantities down and gradually eliminating one quarry after another, and each time my quantities were changed required entirely new financial arrangements on my part. I actually financed myself on some five different plans.

And each time, with more or less of a new combination of men, only to have it undone by further changes, until finally it was decided to accept stone from two of my quarries, and the contract was changed to read from "five years" to "three years"—the quantities asked for being about one-tenth of my original amount bid upon.

Last Financial Arrangement Upset

"By this spring, the matter had dragged along until it reached a point where something would have to be done immediately, if Missouri were going to pave many roads this year. I went before the Commission in open meeting in St. Louis and stated that I had done all that I could do and my last financial arrangement had been upset, and I was not in a position at that moment to finance the contract. But I was willing to co-operate with them in any way possible, even to the extent of selling out my quarries at the exact price they cost me. Or I was willing to join forces with anyone else that could go ahead with the development. It was then decided that the Commission would advance money or purchase $250,000 of machinery for these quarries, the state owning this equipment until it was repaid by me as the operator. All of this discussion took place in open meeting and was given front page publicity in the St. Louis newspapers weeks before the contract was actually executed. Then, however, the commission began inserting so many restrictions and increasing the amount of surety bonds for the state's protection that I was fearful that I could not comply.

"However, I organized a company with cash invested capital of $200,000. In addition, I furnished surety bonds to the Highway Commission in the amount of $275,000 and further gave them a mortgage on all of our property and assets, the Commission retaining the title to the $250,000 worth of equipment purchased by them. I further must pay into a trustee monthly 20 cents per ton on all stone quarried, until the full amount of the $250,000 is returned. So you will see that the taxpayers of the state will not lose a cent even if I blow higher than a kite. Incidentally, to induce a surety company to execute these bonds, it required that I provide them with personal indemnitors from some of my stockholders who listed net assets considerably in excess of a million dollars.

"We are working large gangs of men at both plants, attempting to get in operation as quickly as possible, so that some roads in the western part of the state may be paved this year. So much for the history of this contract. I can assure you that it was not handed to me on a silver platter.

"I have already taken too much space. But would like to say a few things about my quarries, which the stone men from Kansas City seem to think are impossible.

Some Details About My Quarries

"In the article published in your magazine, a picture was given purporting to be the quarry face of one of my quarries, and stating the quarry had been worked for many years and ample development had been done to afford a complete inspection. I want to say that picture is false and is not a picture of either of my quarry faces. Nor is the record of stone—as stated—correct. (This alleged data was subsequently corrected in the article by Edmund Shaw on page 34 of the May 31 issue of Rock Products.—Editor.) The quarry at Gallatin will have a face of about 1900 ft. in length of the Bethany Falls limestone with a small amount of dirt stripping, which we will remove hydraulically, as we have ample water available. I have at one point only over this Bethany Falls ledge about 75,000 yards of Winterset stone which the Kansas City quarry men say will not be accepted by the highway department. I claim this Winterset ledge is perfectly good road metal. But, if not, I have over 100,000 tons of stone sold this year, commercially, so if the highway department does not care for it, others do at a price of 25 cents per ton in excess of the price I am receiving under my contract.

As to Suitability of the Stone

"At the other quarry, I haven't any of the Winterset ledge that the Kansas City men make such a fuss about, and who claim this ledge will break me, and thereby the 'poor taxpayer' will hold the bag. For their information, I have neither the Bethany Falls nor the Winterset, but am in the Plattsburg and Stanton ledge of the Lansing formation, a stone eminently suited for building roads.

"Before I took over these properties I went to the largest bank in Chicago and asked them to tell me who was the best-informed crushed-stone man in the Chicago district, that is, from an operating view-point. I had a portfolio full of engineer's reports and geologists' reports and desired the opinion of the best operator available. I was given the name of a Chicago operator, a gentleman whom you know quite well, and I went to this man and made arrangements with him to go out to Missouri and go over these properties, and estimate my cost of operations, given certain equipment. I went into the Pennsylvania district and secured the best operator the crushed-stone industry afforded in that section. I did likewise in the Indiana district. I was afforded at all places the greatest sort of co-operation and assistance from the leaders in the crushed-stone industry. In all I had seven well-known operators go over my properties, with the result that nine of the properties were rejected as impracticable of operation, leaving me the five quarries before referred to. Two of these five are now being developed. The Chicago banking house, with whom I originally made my financial arrangements, made their own independent investigations—sending out geologists, engineers and operators of their own choosing. These properties have all been core drilled. I have gone as far as I have known how to get the best opinions that money could secure. In the organization of the Consolidated Crushed Stone Co., the corporation taking over my contracts, I have tried to get the very best possible operating organization as I know nothing about quarries, but at least felt I had sense enough to get the very best talent, and I believe I have it.

Prices of Stone in Missouri

"Missouri was paying $1.65 per ton for stone, in the two-thirds of the state referred to, more I believe than any other state in the Union was paying with a large road program, but aside from the price they couldn't have secured their needs—unless someone developed more quarries. Missouri has only one large quarry worthy of the name. And that one is located at Cape Girardeau in southeast Missouri. (A territory I never attempted to cover.) And I have his price list in front of me in which he quotes "2½-in. to ½-in. stone for $1.10 per yard or 88 cents per ton" and I understand even at the price of 88 cents per ton the operator is laying by a substantial amount for his old age. Yet the Kansas City operators claim I am bound for the poorhouse because I have attempted to sell stone at $1.25 per ton. I'll admit we haven't the most ideal quarries in the country; but if we did have I think there would be plenty of men willing to take the sort of contract I have at 75 or 80 cents a ton and make some money.

"I hope all of this hasn't bored you, but in justice to the Highway Commission—which is non-political—composed of four of the best citizens in the state, who are giving their services at a great sacrifice of time and money, and doing the very best they know how, and not playing any favorites to the slightest degree, and in justice to my own intelligence, I cannot refrain from writing you this rather lengthy explanation of my contract.

"If I am wrong about this whole matter, then the best brains in the crushed stone industry are wrong. But if they are, and I doubt it, the taxpayers of Missouri are amply protected, and my associates and I are the losers."

Chemical Exhibit

PLANS are well along for the National Exposition of Chemical Industries, which will be held in New York, September 28 to October 3, 1925. A large number of foreign exhibitors have already applied for space.

Too Many Lime Plants?

This Year's Growth in Productive Capacity About Twice Average Yearly Increase in Consumption

ONE of the most genuine services a reputable trade journal can render both industry and the public is to give a true and accurate picture of the state of the industry it serves, for such a journal is read and relied upon not merely by the producers in the industry but is referred to and quoted by financiers and business men who are, or may be, interested in promoting new plants.

An individual, a business or an industry must "grow or go." One may never rest on his laurels or wait for more favorable opportunities. There are too many competitors anxious to win and quite capable of making their own opportunities. But it is also axiomatic that an individual, a business, an industry can grow too fast.

Impressions at Lime Convention

Lime manufacturers at the recent convention of the National Lime Association at White Sulphur Springs, W. Va., in their private conversations showed genuine concern over the apparent headlong progress toward over-production—at least in certain districts of this country. Charles Warner, in a public address before the convention, gave some cold, hard facts. He said that the lime industry is at present in a very healthful state, that the growth in consumption of lime has been fairly steady and satisfactory and has reflected the promotional efforts of the Association. This average yearly increase in lime consumption has been between 3 and 5%. From a cursory survey of new producing units projected or under construction this year, the producing capacity of the industry will be increased about 10%, or at least double the amount of probable new consumption. In some sections of the country, notably the Ohio dolomite districts, 75 new kilns are being added this year to about 350 existing kilns—a 20% increase.

When Is It Justifiable to Expand?

It is the most natural thing in the world for producers in an industry to discourage potential competitors. Yet under present-day conceptions of business, as exemplified in the promotional efforts of trade associations, broad-gage men in every industry realize that it is fatal for a commodity to lag much behind the demand. It provides too good an opening for the substitution of competitive commodities, and a substitute once installed is not easily replaced. Consequently producers must and do consider this with a broad angle of vision; and their honest conviction regarding the possibilities of over-production is not necessarily based on individually selfish considerations.

The only safe way for a producer or prospective producer to determine his chances of success in adding to present production is a thorough-going survey of the industry and the markets in his available territory. A bank would require such a survey before issuing securities or credit to be based on such new production. Unfortunately for the lime industry there seems to be no adequate engineering and business talent of an independent kind, which can be called upon to make such surveys and reports. The services of such a man are paid for as one pays for the services of a doctor or lawyer. His profit does not lie in commissions on building a plant.

Things to Consider in Lime Production

1. The year 1923 was unquestionably a prosperous one for the lime industry as a whole. Some producers made large profits.
2. These profits, as surpluses, give war chests to tide the manufacturers over a period of harsh competition, should it come.
3. These profits give existing producers ample funds and credit to improve and extend their operations, when business conditions require it.
4. The territory for consuming lime products is generally limited by freight rates, or accessibility.
5. The particular lime consumed depends upon the nature of the trade or the industrial character of the territory reached.
6. The industrial character of a market territory may change. The paper-mill industry of the Northern border of the United States—a big consumer of lime—has undoubtedly reached its acme of production. Future paper mills will be in Canada and in the South where new sources of pulp wood are available.
7. There are two ways to get a new lime used; to cut the existing price or to make a better product.
8. To break in by cutting prices requires an excess of capital over the cost of building the new plant equal to the war chests of existing competitive producers; or a process yet to be developed that will materially cut the cost of manufacture.
9. To break in by a better product is possible. Much attention in the lime industry is being paid to getting out a better product for *chemical uses*. For building use a small producer, if he has the right kind of limestone, seems to be able to make lime as good as the big producer—and as cheaply.
10. A substantial over-production of lime is not to be desired by a prospective new producer any more than by the existing producers.
11. Some limes have a nearly national distribution because of certain physical properties such as plasticity and whiteness. Research work is in progress which any day may solve the problem of making almost any lime plastic. Many local limes are white.
12. The technology of lime manufacture on a large scale is in its infancy and a few years may see important changes.
13. The present tendency in the lime industry is toward big consolidations which will provide adequate distribution and sales organizations. A small individual producer will become more and more at a disadvantage except in strictly local business.

Our 13 points are not designed to cover the subject but to give interested parties something to think about. They do not take into consideration extraneous things which will undoubtedly greatly influence the consumption of lime. But all these and more are considered by hard-headed, sensible business men before investing.

Traffic and Transportation

By EDWIN BROOKER, Consulting Transportation and Traffic Expert,
Munsey Building, Washington, D. C.

Proposed Changes in Rates

THE following are the latest proposed changes in freight rates up to the week beginning June 9:

Central Freight Association

8564. Cement, Coldwater and Quincy, Mich., to Cincinnati, Ohio, applicable on traffic destined to points of the south bank of the Ohio river, except the following points: Altamont, Andrews, Bellevue, Brent, Central Covington, Dayton, Henderson and points taking same rates; Latonia, Louisville, Ky., Ludlow, Owensboro and points taking same rates, Newport, Paducah, Water Works and Wilders, Ky. Present, 13½ cents; proposed, 11 cents.

8569. Sand (other than blast, engine, foundry, molding or silica) and gravel. Milford Junction, and Leeland, Ind., to Syracuse, Ind. Present, 63 cents per net ton; proposed, 50 cents per net ton.

8580. Crushed stone and crushed stone screenings, between Pennsylvania R. R. origin points: Fetterman, Pa., Ellwood Junction, Pa., Wampum, Pa., Hillsville, Pa., Walford, Pa., Neshannock Falls, Pa., Schollard, Pa. B. & O. R. R. origin points: Chewton, Pa., Edenburg, Pa., Ellwood City, Pa., Mahoning, Shale Co., Pa., New Castle, Pa., Rock Point, Pa. (Rates in cents per net ton.):

To	P.R.R. Present	B. & O. Proposed
St. Petersburg, Pa.	115	125
Alum Rock, Pa.	†125	125
Turkey, Pa.	†125	140
Ritts, Pa.	†125	140
Jefferson, Pa.	†125	140
Knox, Pa.	125	140
Elk City, Pa.	*185	140
Shippenville, Pa.	*185	140
Bryners, Pa.	*185	140
Clarion Jct., Pa.	*185	140
Sidell, Pa.	*185	140
Point Mills, Pa.	*185	140
Schills, Pa.	*185	140
Staab, Pa.	*185	140
Lucinda, Pa.	*185	140
Snydersburg, Pa.	*185	160
Tylersburg, Pa.	185	160
Haskill, Pa.	185	160
Crown, Pa.	185	160
Vowinckel, Pa.	310	160
Gilfoil, Pa.	310	160
Rosea, Pa.	310	160
Marionville, Pa.	310	160
Sheffield Jct., Pa.	310	175
Kane, Pa.	310	175
Mt. Jewett, Pa.	310	175

†Intermediate to Knox, Pa.
*Intermediate to Tylersburg, Pa.

8597. Sand and gravel, Richmond, Ind., to New Madison, Ohio. Present, 76 cents per net ton; proposed, 60 cents per net ton.

8598. Sand, foundry, burnt or refuse. Middletown, O., to Ashland, Ky. Present, 18½ cents; proposed, $1.76 per net ton.

8601. Lime, common hydrated, quick or slacked. Marble Cliff, O., to Pontiac, Mich., Gary, Ind., and Joliet, Ill. Present, classification basis applicable to Gary and Joliet; to Pontiac, commodity rate of 18 cents per hundred applies. Proposed, 18 cents to Gary and Joliet and 17 cents to Pontiac.

8605. Molding sand. Zanesville, Dresden, Ellis and Gilbert, O., to Dayton, Springfield, Hamilton and Cincinnati, O. Present, $1.40 to Dayton and Springfield and $1.50 per net ton to Hamilton and Cincinnati; proposed, $1.10 to Dayton and Springfield and $1.20 per net ton to Hamilton and Cincinnati.

8607. Sand and gravel. Ft. Jefferson, O., to Savona, Castine and West Manchester, O. Present, 50 cents to Savona and 60 cents per net ton to Castine and West Manchester, O.; proposed, 40 cents per net ton.

8616. Sand and gravel. Winona Lake, Ind., to Auburn, Ind. Present, 80 cents per net ton; proposed, 75 cents per net ton.

8617. Sand and gravel. Winona Lake and Wolcottville, Ind., to Van Wert, Delphos and Lima, O. Present, to Van Wert, 88 cents; to Delphos and Lima, 90 cents per net ton. Proposed, to Van Wert, 75 cents; to Delphos and Lima, 80 cents per net ton.

8618. Limestone, ground or pulverized. Piqua, O., to Peoria, Bloomington, Champaign, Urbana and Springfield, Ill. Present, $2.65 per net ton; proposed, $2.50 per net ton.

8619. Foundry, burnt or refuse sand. Dayton, O., to Ft. Wayne, Ind. Present, $2.50 per net ton.

8621. Sand and gravel. Ashtabula and Ashtabula Harbor, O., to Salem and Leetonia, O. Present, 14 cents. Proposed, $1 per net ton.

8622. Crushed stone. Hillsville, Pa., and Walford, Pa., to stations on the B. R. & P. Ry. Present, sixth class; proposed (per net ton):

To	Rate
Fenelton, Pa.	1.10
Craigsville, Pa.	1.10
Worthington, Pa.	1.10
Cowan, Pa.	1.20
West Mosgrove, Pa.	1.20
Echo, Pa.	1.30
Valier, Pa.	1.40
Eureka Mine No. 7, Pa.	1.40
Eureka Mine No. 6, Pa.	1.40
Walston, Pa.	1.40
Punxsutawney, Pa.	1.40
Anita, Pa.	1.50
Luciusboro, Pa.	1.70
Indiana, Pa.	1.60
Iseline, Pa.	1.75
East Olivet, Pa.	1.75
West Lebanon, Pa.	1.75
Aultman, Pa.	1.75
Shelocta, Pa.	1.60
Fulton Rune Tipple, Pa.	1.60
Savan, Pa.	1.50
Eleanora Mines, Pa.	1.50
Elenor Mines, Pa.	1.50
Sykes, Pa.	1.50
Stanley, Pa.	1.50
C. & M. Jct., Pa.	1.60
Clearfield, Pa.	1.75
Du Bois, Pa.	1.60
Reynoldsville, Pa.	1.60
Coal Glen, Pa.	1.60
Brockwayville, Pa.	1.60

8629. Cement. From Ironton, O., to Jeffersonville and New Albany, Ind., and Louisville, Ky.; also Maysville and Winchester, Ky., applicable on traffic to points south of south bank of Ohio river. Present, to Jeffersonville, New Albany and Louisville, 13½ cents; to Winchester, Ky., 14½ cents, and to Maysville, Ky., 10½ cents. Proposed, 10 cents to Jeffersonville, New Albany and Louisville and 8 cents to Maysville and 9 cents to Winchester, Ky.

8630. Gypsum rock, run of mine; gypsum rock, crushed (not ground); gypsum rock, ground (land plaster), plaster, calcined (stucco, plaster of paris), plaster, wall; plasterboard. Producing points named in Item 2455B of C. F. A. T. B. Trf. 130-0 to Canada. Present, 83.33% of sixth class; proposed, classification basis.

8631. Gravel, torpedo sand and sand (other than blast, engine, foundry, glass, molding and silica). Spalding, Ill., to C. F. A. territory. Present, sixth class; proposed, 10 cents per net ton higher than rates in effect from Joliet and Plainfield, Ill.

8623. Cupola slag. Detroit, Mich., to Port Allegheny, Pa. Present, 33 cents; proposed, 30 cents.

8643. Crushed stone coated with oil, tar or asphaltum. Shaw Junction, Pa., to destinations to which rates on crushed stone are named in P. & L. E. Trf. B. No. 2611. Present, sixth class basis; proposed, 15 cents per net ton in excess of the crushed stone rates published in P. & L. E. Trf. B. No. 2611.

8649. Ashes, cinders (except mill cinder and pyrites ore cinder) and granulated furnace slag. Columbus, O., to Michigan, Illinois, Indiana and Wisconsin.

To—	Rates per net ton Present	Proposed
Albion, Mich.	$1.71	$2.39
Benton Harbor, Mich.	1.89	2.65
Canton, Ill.	2.61	3.65
Chicago, Ill.	2.25	3.15
Detroit, Mich.	1.62	2.27
Grand Rapids, Mich.	2.16	3.02
Hoopeston, Ill.	1.89	2.65
Indianapolis, Ind.	1.62	2.27
Joliet, Ill.	2.25	3.15
Marion, Ind.	1.44	2.02
Milwaukee, Wis.	2.61	3.65
Muncie, Ind.	1.35	1.89
Muskegon, Mich.	2.34	3.28
Racine, Wis.	2.61	3.53
Rockford, Ill.	2.61	3.65
St. Charles, Ill.	2.34	3.28
Terre Haute, Ind.	1.80	2.52
West Allis, Wis.	2.61	3.65

8650. Sand. Ottawa, Ill., and Muscatine, Ia., to Benton Harbor, Mich. Present, $2.14 per net ton from Ottawa, Ill., and $2.52 per net ton from Muscatine, Ia.; proposed, $2.02 per net ton from Ottawa, Ill., and $2.40 per net ton from Muscatine, Ia.

Southern Freight Association

14138. Non-application of class rates on cement, carloads, from Chattanooga, Tenn., to Southern points. It is proposed to provide in Agt. Glenn's Chattanooga Trf. I. C. C. A397 for the non-application of class rates on cement, carloads, from Chattanooga, Tenn., and group points, thereby permitting the application of combination rates. It is stated that to a large number of destinations the through class rates are in excess of combination.

14150. Sand, carloads, from Mount Holly, N. C., to Tucanpau, Duncan and Chick Springs, S. C. Combination rates now apply. Proposed, to Tucampau and Duncan, $1.31; to Chick Springs, $1.35 per net ton; made on basis of using the scale proposed by carriers for application in Georgia and Alabama for the short line distance not to exceed present rate to Greenville, S. C.

14152. Limestone, ground or pulverfized, carloads, from Ladds, Ga., to Charleston, S. C., Savannah, Ga., and Jacksonville, Fla. Present rate to Charleston, $2.93; proposed, $1.98; to Savannah, present rate $2.25, proposed $1.98; to Jacksonville, Fla., present $2.48, proposed $2.25 per net ton. Proposed rates are the same as at present in effect on ground limestone from Whitestone, Ga., to these points.

14171. It is proposed to establish rates on "Cement, natural or portland (building cement), in bulk or in packages as provided for carload shipments in the Consolidated Classification, carload, minimum weight 50,000 lb., except when for carrier's convenience a car of less capacity be furnished the minimum weight will be the capacity of car but not less than 40,000 lb.," from Birmingham, North Birmingham and Boyles, Ala., to L. & N. R. R. branch line stations in Kentucky, in line with rates in main line stations, observing the rates to common points, as maxima or minima as the case may be. Statement showing present and proposed rates will be furnished upon request.

14173. Slag, minimum weight 30,000 lb. per net ton, but not in excess of marked capacity of car per ton 2000 lb., from points in Birmingham district, Alabama City-Gadsden group and Anniston group to stations on the Georgia and Florida Ry. between Sparks and Moultrie, Ga. Combination rates now apply. Proposed, $2.25 per net ton, made same as current rate from Birmingham district to Adel and Sparks, Ga. It is stated proposed rate compares favorably with rates to other South Georgia destinations.

14180. It is proposed to amend L. & N. R. R. Switching Tariff, G. F. O. 77B I. C. C. A15200, to provide for the cancellation of switching charge of $5.85 per car on stone and screenings from the Dalton Stone Co. to industries on tracks of the L. & N. R. R. at Hopkinsville, Ky., permitting the charges now applicable on other classes of freight to apply.

14217. Stone, crushed or rubble, carloads, minimum weight 25 net tons, from Greystone, Littleton, Middleburg, Vaughan and Wise, 90 cents per net ton. (Class A.) Proposed, $2.77 per net ton, based on Portsmouth, Va., combination, using published commodity rate of 90 cents to Portsmouth, plus proportions of $1.87 per net ton acceptable to line beyond.

14238. Cement, carloads, from Birmingham and Leeds, Ala., to Georgia points named below. Present and proposed rates: From Birmingham, Ala., to Chambers and Silver Creek, Ga., present, 13½ cents; proposed, 11 cents. To Chickamauga, Ga., present, 16½ cents; proposed, 15 cents. To Fort Benning Junction, Ga., present, 16 cents; proposed, 15 cents. From Leeds, Ala., to Cenchat, Ga., present, 16 cents; proposed, 15 cents per 100 lb. The proposed rates from Birmingham are the same as now in effect from Leeds and the suggested rates to Chambers and Silver Creek are also same as at present in effect from Birmingham to Rome, Ga. The proposed rate from Leeds is the same as from Birmingham to Chickamauga, Ga. The proposed rate from Leeds is the same as from Birmingham to Chickamauga, Ga.

14250. Sand and gravel, carloads, from Graceville, Fla., to Geneva, Samson and Opp, Ala. Class N rates now apply. Proposed: To Geneva and Samson, 4½ cents; Opp, 5 cents per 100 lb.,

made in line with present rates from and to other points on the L. & N. R. R. for similar distance.

14261. Cement, carloads, from Birmingham, Ala., group shipping points to Halawaka, Ala. (C. V. Ry.) Combination rates now apply. Proposed, $2.84 per net ton, same as present rate from Leeds, Ala.

14276. It is proposed to revise present rates on cement, carloads, from Leeds and Ragland, Ala., to Alabama points to be the same as in effect from Birmingham, Ala.

14284. Cement, carloads, from Southern producing points show in in Agt. Glenn's Cement Trf., I. C. C. A 455, to Illinois Central R. R. stations between Hickman, Ky., and Dyersburg, Tenn. (Not inclusive.) It is proposed to revise present rates to basis of 2 cents per 100 lb. higher than the current rates to Dyersburg, Tenn., which basis reflects the same differential as is observed in connection with rates from St. Louis, Mo., and Kosmosdale, Ky., to the I. C. R. R. stations in question. The proposed revision, generally speaking, results in advances.

14296. Gravel, carloads, from Cairo, Ill., to Memphis, Tenn. Present rate, $1.90; proposed, $1.33 per net ton, based 20 cents per ton over current rate from Paducah, Ky., to Memphis, Tenn.

Trunk Line Association

11986. To cancel commodity rates on cement from Erie R. R. stations, Lancaster to Lockport, N. Y., inclusive; Salamanca to Hamburg, N. Y., inclusive; Water Valley to Jamestown, N. Y., inclusive; also from Pennsylvania R. R. stations, Ebenezer to Louisiana, Carroll Street; Salamanca to Carrollton, N. Y., to Tunesassa Lumber Co., Nos. 1 and 2, New York; Wolf Run to Kinzua, Pa.; Dew Drop to White Gravel, Pa.; Dunkle, Blissville, Route Run, to West Line, Pa.; Big Bend to Glade, Pa., and Clymer to Buffalo, N. Y., to points in Alabama, Arkansas, Florida, etc., named in Speiden's Trf. I. C. C. 437, account rates being obsolete. Class rates to apply.

12046. Sand and gravel, N. O. I. marked capacity of car, except when car is loaded to cubical or visible capacity, actual weight will apply, from Ballina, N. Y., to stations on the Lehigh Valley R. R., Vanetten, Interlaken, Burdett, Cayuta, Odessa, Aurora, Cato, N. Y., and other points, $1.20 to $1.70 per net ton.

12058. Sand (other than blast, engine, glass, molding, foundry or silica), carloads, minimum weight 90% of marked capacity of car, except when car is loaded to cubical or visible capacity, actual wegiht will apply, from Philadelphia to Germansville, Pa., $1.40 per 2000 lb.

12068. To cancel commodity carload rates on furnace slag from Scranton and Park Place, Pa., to Throop to Carbondale and Forest City, Pa., account no movement. Classification basis to apply.

Western Trunk Line Docket

3966. Sand and gravel, carloads, from Dallas City, Ill., to Mount Pleasant, Ia. Present, Class E, 11 cents per 100 lb. Proposed, $1 per net ton. Minimum weight, 90% of the marked capacity of the car; except when loaded to full visible capacity, actual weight shall apply.

2079-A. Stone, crushed and crushed granite, from Red Granite, Wis., to Mt. Pleasant, Ia. Present, Class E, 20½ cents; proposed, 12 cents per 100 lb. Minimum weight 90% of the marked capacity of the car; except when loaded to full visible capacity, actual weight will apply.

3395-A. Lime, carloads, from Hannibal, Quincy and Marblehead, Ill., to Sturgeon Bay, Wis., and points intermediate between Green Bay and Sturgeon Bay, Wis. Present, Class C, 26 cents; proposed, 21½ cents. Minimum weight 30,000 lb.

Texas-Louisiana Tariff Bureau

5974-TX. Lime, carload rates on, from Dittlinger, McNeill and Round Rock to Ft. Worth and Dallas. Proposition from shippers to establish on lime, carloads, minimum weight 40,000 lb., from Dittlinger, McNeill and Round Rock, Texas, to Ft. Worth, Texas, 14.5 cents per 100 lb. and to Dallas, 16 cents per 100 lb. Also same reductions in cents per 100 lb. will be made in the rate from Oglesby, Lime City and Excellent, Texas, to Ft. Worth and Dallas as from Dittlinger, McNeill, etc.

Economist Says Cement Price Stability Is Public Asset

WRITING to the Philadelphia *North American*, Thomas Sewall Adams, professor of economics in Yale University, says that the tendency of cement prices is toward stability and that this is a real asset to the public. He explains this by saying:

"Prices to purchasers of cement, are likely to be substantially uniform and comparatively stable. There are ample reasons why, under competition, they should be. First of all, cement is thoroughly standardized or uniform, and nobody charges that this standardization is the result of monopolistic combination. Terms of sale have come to be similarly uniform. Price quotations are mailed or telephoned frequently to prospective customers, and the prices quoted by one producer are quickly communited to other producers. There are no future dealings in this industry.

"Under such circumstances, it is price diversity rather than price uniformity which should naturally arouse suspicion. Why purchaser X should pay more than purchaser Y for exactly the same product, sold under exactly the same terms, is difficult to understand. And how producer A could get more than producer B under these conditions is equally difficult to explain."

Cement Man on Extensive Motor Trip

AN EASTON, Penn., newspaper carries the following news item:

Traveling in an automobile fully equipped for a long journey, Mr. and Mrs. Lewis Roseberry, of 133 North Third street, this city, left today, their objective point being California. The automobile contains a complete household outfit, and it is the intention of the travelers to spend the entire time consumed in crossing the country, estimated at one month, in the open. Their plans also call for a stay of one month in California, after which they will start on the return journey.

Mr. Roseberry was formerly in business in California, where he supervised the construction of several cement plants. While on their trip westward, Mr. and Mrs. Roseberry will visit their son Walter at Columbus, Ohio. At Los Angeles, Calif., they will visit another son, Elwood H. Roseberry, and his wife.

After a sojourn at that place, they will travel north along the Pacific coast where Mr. Roseberry is interested in the cement mill business. They will cross the border after leaving Seattle, Wash., into the Canadian Rockies and tour the scenic wonders of Western Canada. The trip will cover about 15,000 miles and will require from four to five months.

Glass Sand Along the Potomac River

THE glass-sand industry along the border line of Maryland and West Virginia, although scarce 10 years old, has passed in production tenfold the deposit at Mapleton, Pa., which for a long time was supposed to be the one place in America where glass sand was available.

On both sides of the mountain ridge beside the Potomac river, development has been going on for 10 years and today more than 60 cars are shipped daily from Hancock station.

The quality is said to be the finest in the world and the supply in sight will last for generations at the present rate of quarrying.

Twenty-seven years ago this stretch of hills was sold for taxes for $2.48 an acre. Since that time the section has passed through various ownerships until it has been absorbed by nine operating companies.

The sand from this section is used almost exclusively for the finest plate and cut glass and mirrors.

There is scarcely enough of the inferior grade to satisfy the demand for the cheaper window lights.

The deposit seems to run spasmodically through the Blue Ridge. It is found at the north end of Mapleton and at the termination of the ridge in Tennessee.

Baltimore capital is interested in the glass sand industry extensively. It had a large hand in the developing of the Mapleton deposit, and in the Hancock section it has done much to develop the country from a hoop-pole and timber country to the productive basis of more than fifteen millions of dollars a year.—*McConnellsburg (Pa.) News.*

Southern California Uses Much Cement

"THE cement producing capacity of southern California is more than 30,000 bbl. a day—11,000,000 bbl. a year," said C. L. Carman of the Riverside Portland Cement Co., at a session of the Portland Cement Association.

"It may be thought that such capacity to supply the wants of a population of 2,000,000 people is optimistic, even for southern California," he went on. "The truth of the matter is, almost 50% of this capacity was created during the last 18 months under the stimulation of a sharp, but no doubt temporary, uptrend in building activity in this vicinity."—*Los Angeles Times.*

Phosphate Company Sues Railroad

The supreme court of Tennessee has heard argument in the case of the Middle Tennessee Railroad et al., vs. Independent Phosphate Company et al., from the Davidson docket, in which the question of a breach of contract is involved. It seems that the railroad had agreed to build tracks to the plant of the phosphate company in consideration of which the company was to give a certain amount of business to the railroad company.—*Nashville Banner.*

The Rock Products Market

Wholesale Prices of Crushed Stone

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Blakeslee, N. Y.	1.00	1.40	1.40	1.30	1.30	.....
Buffalo, N. Y.			1.30 per net ton all sizes			
Cobleskill, N. Y.	1.25	1.25	1.25	1.25	1.25	.....
Coldwater, N. Y.			1.50 per net ton all sizes			
Eastern Pennsylvania	1.35	1.35	1.45	1.35	1.35	1.35
Munns, N. Y.	1.00	1.40	1.40	1.30	1.40	.....
Prospect, N. Y.	1.00	1.40	1.40	1.25	1.25	.....
Walford, Pa.	.....	.....	.....	.....	1.60b	.....
Watertown, N. Y.	.50	.....	1.75	1.50	1.50	1.50
Western New York	.85	1.25	1.25	1.25	1.25	1.25
CENTRAL						
Alton, Ill.	1.75	.....	1.75	1.50	.....	.....
Buffalo, Iowa	.90	.....	1.30	1.10	1.15	1.15
Cypress, Ill.	.....	1.20	1.20	1.20	1.20	.....
Dundas, Ont.	.90	1.10	1.10	1.05	1.00	1.00
Gary, Ill.	1.10	1.40	1.10	1.10	1.10	1.10
Greencastle, Ind.	1.25	1.25	1.15	1.05	1.05	1.05
Lannon, Wis.	.80	1.00	1.00	.95	.95	.95
Northern Wisconsin	.50@1.75	.....	1.00	.90	.90	.....
St. Vincent de Paul, P. Q.	.75	1.25@1.45	1.10	1.00	1.00	1.00
Sheboygan, Wis.	1.00	1.10	1.10	1.10	1.10	.....
Stone City, Iowa	.75	.....	1.40	1.30	1.25	.....
Toledo, Ohio	1.60	1.70	1.70	1.60	1.60	1.60
Toronto, Canada	1.90‡	2.25‡	2.25‡	2.25‡	2.00‡	2.00‡
Waukesha, Wis.	1.15	1.15	1.15	1.15	1.15	1.15
Youngstown, Ohio	.....	.....	1.30	1.55	1.55	1.55
SOUTHERN:						
Alderson, W. Va.	.75	1.75	1.75	1.60	1.50	.....
Bridgeport and Chico, Texas	1.00@1.25	1.50@1.60	1.30@1.40	1.25@1.35	1.25@1.35	1.25@1.30
Cartersville, Ga.	1.75	1.50	1.50	1.15	1.00	.....
El Paso, Texas	1.00	1.00	1.00	1.00	.....	.....
Graystone, Ala.		Crusher run with fines out, 1.00 per net ton				
Graysville, Ga.	1.00	.90@1.00	.....	.90@1.00	.80@1.00	.....
Rock Crusher, Ky.	1.50	1.25	1.25	1.25	1.25	1.15
Russellville, Ala.	1.25	1.25§	1.50a	1.15§	1.00a	1.00
WESTERN:						
Atchison, Kans.	.50	.....	2.00	2.00	2.00	1.60||
Blue Spr'gs & Wymore, Neb.	.20	1.45	1.45	1.35@1.40	1.25@1.30	1.20
Cape Girardeau, Mo.	1.35	.....	1.25	1.25	1.00	.....
Kansas City, Mo.	1.00	1.65	1.65	1.65	1.65	1.65

Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Branford, Conn.	.60	1.60	1.35	1.15	1.00	.....
Duluth, Minn.	.90@1.00	2.25	1.90@2.00	1.40@1.50	1.35@1.40	1.35@1.40
Dresser Junction, Wis.	1.00	1.00	2.25	2.00	1.75	.....
El Cerrito, Calif.	1.75	1.75	1.75	1.75	1.75	.....
Dwight, Calif.	1.75	1.75	1.75	1.75	1.75	.....
E. Summit, N. J.	1.50	2.00	1.80	1.40	1.40	.....
Eastern Maryland	1.10	1.75	1.70	1.60	1.50	1.50
Eastern Massachusetts	.85	1.75	1.75	1.25	1.25	1.25
Eastern New York	.75	1.25	1.25	1.25	1.25	1.25
Eastern Pennsylvania	1.10	1.75	1.70	1.60	1.50	1.50
Meriden, Middlefield, New Britain, Rocky Hill, Conn.	.60	1.60	1.35	1.15	1.00@1.10	1.00
Northern New Jersey	1.50	2.00	1.80	1.40	1.40	.....
Oakland, Calif.	1.75	1.75	1.75	1.75	1.75	.....
Richmond, Calif.	.50	.....	1.50*	1.50*	1.50*	.....
San Diego, Calif.	.50@.75	1.80@1.90	1.60@1.80	1.35@1.55	1.35@1.55	1.25@1.45
Springfield, N. J.	1.60	2.00	2.00	1.60	1.60	.....
Westfield, Mass.	.60	1.50	1.35	1.20	1.10	.....

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Baldwin Park, Calif.	.90@1.10	.....	.60@ .90	.....	.60@ .90	.....
Berlin, Utley and Red Granite, Wis.	1.60	1.70	1.60	1.50	1.40	.....
Columbia, S. C.	.50	.....	2.00	.....	1.60	.....
Eastern Penna.—Sandstone	1.25	1.65	1.60	1.40	1.40	1.25
Eastern Penna.—Quartzite	1.20	1.35	1.20	1.20	1.20	1.20
Lithonia, Ga.—Granite	.75	2.00	1.75	1.25	1.25	1.25
Lohrville, Wis.	1.65	1.65@1.70	1.65	1.45	1.50	.....
Middlebrook, Mo.—Granite	.....	.....	2.00@2.25	2.00@2.25	.....	1.25@2.00
Northern New Jersey (Basalt)	150	2.00	1.80	1.40	1.40	.....

*Cubic yd. †1 in. and less. ‡Prices include 90c freight. ||Rip rap per ton. §Dust in. (a) Dust out. (b) less 10c 15 days.

Agricultural Limestone

(Pulverized)

Osborne, Penn.—100% thru 20 mesh; 60% thru 100 mesh; 45% thru 200 mesh. (Less 50 cents commission to dealers 5.00

Hillsville, Pa.—Analysis, 94% $CaCo_3$, 1.40% $MgCO_3$, 75% thru 100 mesh; 94% thru 50 mesh; sacks, 5.00; bulk 3.50

Jamesville, N. Y.—Analysis, 89.25% $CaCO_3$; 5.25% $MgCO_3$; pulverized, bags, 4.00; bulk 2.50

Watertown, N. Y.—Analysis 96-99% $CaCo_3$; 0.02% $MgCo_2$—90% thru 100 mesh, bags, 4.50; bulk 3.00

Rockdale, Mass. — Analysis, 90% $CaCO_3$—50% thru 100 mesh; paper bags, 4.75; cloth, 5.25; bulk 3.25

North Pownal, Vt. — Analysis, 90% $CaCO_3$—50% thru 100 mesh; paper bags, 4.75; cloth, 5.25; bulk 3.25

West Stockbridge, Mass. — Analysis, 90% $CaCO_3$—50% thru 100 mesh; paper bags, 4.75; cloth, 5.25; bulk 3.25

Dundas, Ont., Can.—Analysis, 53.80% $CaCO_3$, 43.31% $MgCO_3$; 35% thru 100 mesh, 50% thru 50 mesh, 100% thru 10 mesh; bags, 4.75; bulk 3.00

Marblehead, Ohio — Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$; 60% thru 100 mesh; 70% thru 50 mesh; 100% thru 10 mesh; 100% thru 4 mesh; 80 lb. paper sacks, 5.00; bulk 3.50

Piqua, Ohio—Total neutralizing power 95.3%; 100% thru 10, 60% thru 50; 50% thru 100 ..... 2.10@ 2.25
100% thru 10, 90% thru 50, 80% thru 100; bags, 5.00; bulk 3.50
100% thru 100, 85% thru 200; bags, 7.00; bulk 5.50

Mayville, Wis. 2.35

Cartersville, Ga. — Pulverized limestone 2.50

Knoxville, Tenn.—80% thru 100 mesh, bags, 3.95; bulk 2.70

Linville Falls, N. C.—Analysis, 57% $CaCO_3$, 39% $MgCO_3$; 50% thru 100 mesh; 200 lb. burlap bag, 4.00; bulk 2.75

Colton, Calif.—Analysis, 95% $CaCO_3$, 3% $MgCO_3$—all thru 20 mesh—bulk 4.00

Marion, Va. — Analysis, 90% $CaCO_3$, 2% $MgCO_3$; 42.5% thru 100 mesh, 11.3% thru 80, 20.2% thru 60, 22.8% thru 40, 3.2% thru 20 and under or 75% thru 40 mesh; pulverized, per ton 2.00

Agricultural Limestone

(Crushed)

Bedford, Ind.—Analysis, 98½% $CACO_3$, ½% $MgCO_3$; 90% thru 10 mesh, 30% thru 100 mesh ..... 1.50@ 2.00

Independence, Mo. — Analysis, 94% $CaCO_3$ 1.25

Bettendorf, Iowa — 97% $CaCO_3$, 2% $MgCO_3$; 50% thru 100 mesh; 50% thru 4 mesh 1.50

Blackwater, Mo.—95% $CaCO_3$; 100% thru 8 mesh 1.00

Cape Girardeau, Mo.—Analysis, 93% $CaCO_3$, 3.5% $MgCO_3$; 90% thru 50 mesh 1.50

Carthage, Mo. — Analysis, 98½% $CaCO_3$; 100% thru 10 mesh, 30% thru 100 mesh 1.75

Alton, Ill.—Analysis 99% $CACO_3$; 100% thru 4 mesh 1.75

Gary, Ill.—Analysis, 60% $CaCO_3$, 40% $MgCO_3$; 90% thru 100 mesh 1.10

Cypress, Ill. — Analysis, 96% $CaCO_3$, 2.5% $MgCO_3$; 50% thru 50 mesh 1.25

Kansas City, Mo.—50% thru 100 mesh 1.25

Moline, Ill.—97% $CaCO_3$, 2% $MgCO_3$ —50% thru 100 mesh; 50% thru 4 mesh 1.50

(Continued on next page)

Agricultural Limestone

(Continued from preceding page)

Lannon, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 99% through 10 mesh; 46% through 60 mesh	2.00
Screenings (¼ in. to dust)	1.00
Marblehead, Ohio.—Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$; 100% thru 4 mesh; 85% thru 10 mesh; 53% thru 50 mesh; 40% thru 100 mesh (meal) bulk	1.60
32% thru 100 mesh; 51% thru 50 mesh; 83% thru 10 mesh; 100% 4 mesh (screenings) bulk	1.25
Milltown, Ind.—Analysis, 91.95% $CaCO_3$, 4.87% $MgCO_3$; 36% thru 100 mesh, 43.2% thru 50 mesh	1.45@ 1.60
Monroe, Mich.—Analysis, 51.91% $CaCO_3$, 44.17% $MgCO_3$; agricultural limestone meal, 3/16 in. to dust, 30% thru 100 mesh	1.60
River Rouge, Mich.—Analysis, 54% $CaCO_3$, 40% $MgCO_3$; bulk	.80@ 1.40
Stone City, Iowa.—Analysis, 98% $CaCO_3$; 50% thru 50 mesh	.75
Bridgeport, Texas: Screenings from ⅛ in. down to flour	1.50
Chico, Texas: Screenings from ⅛ in. down to flour	1.50
Alderson, W. Va.—Analysis, 90% $CaCO_3$; 50% thru 100 mesh	1.50
Ft. Springs, W. Va.—Analysis, 90% $CaCO_3$; 50% thru 100 mesh	1.50

Miscellaneous Sands

Silica sand is quoted washed, dried and screened unless otherwise stated.

Glass Sand:	
Berkeley Springs, W. Va.	2.25@ 2.50
Cedarville, N. J.—Damp	1.75
Dry	2.25
Cheshire, Mass: 6.00 to 7.00 per ton; bbl.	2.50
Columbus, Ohio	1.50@ 1.75
Grays Summit and Klondike, Mo.	2.00
Hancock, Md.—Damp	1.50
Dry	2.00
Mapleton, Pa.	2.00@ 2.50
Mapleton Depot, Pa.	2.25@ 2.50
Massillon, Ohio	3.00
Michigan City, Ind.	.50
Millville, N. J.	2.00
Mineral Ridge, Ohio	2.50
Ottawa, Ill.	1.25@ 1.50
Pacific, Mo.	2.25@ 3.00
Pittsburgh, Pa.—Dry	4.00
Damp	3.00
Ridgway, Pa.	2.50
Rockwood, Mich.	2.75@ 3.25
Round Top, Md.	2.25
San Francisco, Calif.	3.00@ 3.50
St. Louis, Mo.	1.50@ 3.00
South Vineland, N. J.—Damp	1.75
Dry	2.25
Thayers, Pa.	2.50
Utica, Ill.	1.25 1.40
Zanesville, Ohio	2.50
Foundry Sand:	
Albany, N. Y.: Core	1.50
Molding fine, brass molding	2.25
Molding coarse	2.00
Sand blast	4.00
Arenzville, Ill.—Molding fine	1.50@ 1.70
Brass molding	1.75
Cheshire, Mass.—Furnace lining, molding fine and coarse	5.00
Sand blast	5.00@ 8.00
Stone sawing	6.00
Columbus, Ohio: Core	.25@ .35
Furnace lining	2.00@ 2.50
Molding fine	1.50@ 2.00
Molding coarse	1.50@ 1.75
Sand blast	3.50@ 5.00
Stone sawing	1.50
Traction	.25@ 1.00
Brass molding	2.00

(Continued on next page)

Wholesale Prices of Sand and Gravel

Prices given are per ton, f. o. b. producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel, ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
EASTERN:						
Ambridge and So. Hts., Pa.	1.25	1.25	1.15	.85	.85	.85
Attica, N. Y.	.75	.75	.85	.75	.75	.75
Buffalo, N. Y.	1.10	.95	.....	.....	.85	.....
Farmingdale, N. J.	.48	.48	.75	1.10	1.10	.....
Franklinville, N. Y.	.75	.75	.85	.75	.75	.75
Leeds Jct., Maine	.....	.50	1.75	.....	1.35	1.25
Machias, N. Y.	.75	.75	.75	.75	.75	.75
Pittsburgh, Pa., and vicinity	1.25	1.25	.85	.85	.85	.85
Washington, D. C.—Rewashed, river	.85	.85	1.70	1.50	1.30	1.30
CENTRAL:						
Attica, Ind.	.75	.75	.75	.75	.75	.75
Barton, Wis.	.....	.60	.....	.70	.70	.....
Beloit, Wis.	.....	.70	.....	.....	.80	.....
Columbus, Ohio	.85	.85	.75	.75	.75	.75
Covington, Ind.	.75	.75	.75	.75	.75	.75
Des Moines, Iowa	.50	.50	1.25	1.60	1.60	1.60
			Unwashed ballast, .50 ton			
Eau Claire, Wis.	.40	.40	1.00@1.25	.....	.....	.85
Elkhart Lake, Wis.	.44	.40	.50	.60	.60	.60
Ft. Dodge, Iowa	1.00	1.00	2.10	2.10	2.10	2.10
Grand Rapids, Mich.	.....	.50	.....	.80	.70	.70
Hamilton, Ohio	.....	1.00	.....	.....	1.00	.....
Hersey, Mich.	.50	.....	.....	.....	.....	.75
Indianapolis, Ind.	.60	.60	.....	.90	.75@1.00	.75@1.00
Janesville, Wis.	.....	.65@ .75	.....	.....	.65@ .75	.....
Mason City, Iowa	.45@ .55	.45@ .55	1.55	1.55	1.45	1.45
Mankato, Minn.	.....	.40	.40	.....	1.25	.....
Milwaukee, Wis.	1.01	1.01	1.21	1.21	1.21	1.21
Minneapolis, Minn.	.35	.35	1.35	1.35	1.35	1.25
Moline, Ill.	.60	.60	1.20	1.20	1.20	1.20
Palestine, Ill.	.75	.75	.75	.75	.75	.75
St. Louis, Mo., f.o.b cars	1.20	1.45	1.65§	1.45	.....	1.45‖
Silverwood, Ind.	.75	.75	.75	.75	.75	.75
Summit Grove, Ind.	.75	.75	.75	.75	.75	.75
Terre Haute, Ind.	.75	.60	.75	.90	.90	.85
Waukesha, Wis.	.50	.50	.80	.80	.80	.80
Winona, Minn.	.40	.40	1.25	1.10	1.00	1.00
Yorkville, Sheridan, Oregon, Moronts, Ill.			.37 to .65 pit			
Zanesville, Ohio	.70	.....	.60	.....	.90	.....
SOUTHERN:						
Brookhaven, Miss., Roseland La.	.....	1.35	.....	.....	1.25	.....
Charleston, W. Va.	all sand 1.37 f.o.b cars		all gravel 1.47 f.o.b. cars			
Knoxville, Tenn.	1.00	1.00	1.20	1.20	1.20	1.20
Macon, Ga.	.50	.50	.....	.75	.75	.75
New Martinsville, W. Va.	1.00	1.00	.....	1.20	.....	.80
WESTERN:						
Baldwin Park, Calif.	.....	.25@ .35	.....	.....	.50@ .75	.....
Kansas City, Mo.			Kaw river sand .75 per ton f.o.b. plants			
Los Angeles, Calif.	.70	.70	1.10@1.15	.....	1.10@1.15	.....
Pueblo, Colo.	1.10*	.90*	.....	1.75*	.....	1.60*
San Diego, Calif.	50@ .65	.80@ .90	1.40@1.50	1.20@1.30	1.00@1.10	1.00@1.10
Seattle, Wash. (bunkers)	1.50*	1.50*	.....	1.50*	.....	1.50*
Webb City, Mo. (flint)	.75	.75	.25@ .75b	.85b	1.25c	1.15c

Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
Boonville, N. Y.	.60@ .80	.....	.55@ .75	.....	.....	1.00
Brookhaven, Miss., Rosel'd, La.	.75	.50	.....	.....	1.25	.....
Dudley, Ky.‡	1.05	1.05	.....	1.00	.....	.....
East Hartford, Conn.			Sand, .65 per cu. yd.			
Elkhart Lake, Wis.	.40	.....	.....	.....	.....	.....
Fishers, N. Y. (filter sand)	.75	.60@ .75	.....	.60	.....	.....
Gainesville, Texas	.....	.95	.....	.....	.....	.55
Grand Rapids, Mich.	.....	.....	.....	.80	.....	.....
Hamilton, Ohio	.....	.....	.....	.....	.70	.....
Hersey, Mich.	.....	.....	.....	.55	.....	.....
Indianapolis, Ind.			Mixed gravel for concrete work, .65			
Lindsay, Texas	.....	.95	.....	.....	.....	.55
Mankato, Minn.			Pit run gravel, .50			
Moline, Ill.	.60	.60	Concrete gravel, 50% G., 50% S., 1.00			
Montezuma, Ind.	.....	.....	.....	.....	.....	.60
St. Louis, Mo.	.....	.....	.....	.....	.....	1.55
Summit Grove, Ind.	.50	.50	.50	.50	.50	.50
Waukesha, Wis.	.60	.60	.60	.60	.60	.60
Winona, Minn.	.60	.60	.60	.60	.60	.60
York, Pa.	1.10	1.10	(crushed rock)			
Zanesville, Ohio	.....	.60	.....	.....	.....	.....

*Cubic yd.; †pebbles; §⅝ in. and less; ‡crushed rock; ‖2½ in. and less; (a) ¾ in. and less; (b) flint chats; (c) crushed flint.

Miscellaneous Sands

(Continued from preceding page)

Delaware, N. J.:	
Molding fine	2.00
Molding coarse	1.90
Brass molding	2.15
Dunbar, Pa.:	
Traction (Mill)	2.25
Eau Claire, Wis.:	
Roofing sand	3.25
Sand blast	3.25
Franklin, Pa.:	
Core	2.00
Furnace lining	2.50
Molding coarse	2.00
Brass molding	2.75
Grays Summit and Klondike, Mo.:	
Molding fine	1.75@ 2.00
Joliet, Ill.:	
No. 2 molding sand and loam for luting purposes; milled	.85
Bank run	.65
Kasota, Minn.:	
Stone sawing (green)	1.50
Mapleton, Pa.:	
Molding fine	2.25
Roofing Sand	2.25
Mapleton Depot, Pa.:	
Molding coarse	2.25
Molding fine	2.50
Traction	2.00@ 2.25
Roofing sand	2.25
Massillon, Ohio:	
Molding fine, coarse, furnace lining and core	2.50
Traction	2.50
Michigan City, Ind.:	
Core	.50@ .55
Traction	.40
Millville, N. J.:	
Core	2.00
Mineral Ridge and Ohlton, Ohio:	
Core (damp)	1.90
Furnace lining, roofing sand, stone sawing, traction (green)	1.75
Molding fine and coarse (green)	2.00
Montoursville, Pa.:	
Core	1.25@ 1.40
Traction	1.10
Brass molding	1.50
New Lexington, Ohio:	
Molding fine	2.00
Molding coarse	1.50
Ottawa, Ill.:	
Crude silica sand	.75@ 1.00
Core, furnace lining, steel molding	1.50
Roofing sand	1.50@ 4.50
Sand blast	4.50
Ottawa, Minn.:	
Crude silica sand	.75@ 1.00
Pacific, Mo.:	
Core, furnace lining	1.00@ 1.25
Molding fine	.90@ 1.00
Stone sawing	1.00@ 1.75
Molding coarse	.85@ 1.00
Ridgway, Pa.:	
Core	2.00
Furnace lining, molding fine, molding coarse	1.25
Traction	2.25
Rockwood, Mich.:	
Roofing sand	3.00
Sand blast	3.75
Round Top, Md.:	
Core	1.60
Traction	1.75

Crushed Slag

City or shipping point		¼ in.	½ in.	¾ in.	1½ in.	2½ in.	3 in.
EASTERN:	Roofing	down	and less	and less	and less	and less	and larger
Buffalo, N. Y.	2.25	1.25	1.35	1.25	1.25	1.25	1.25
E. Canaan, Conn.	4.00	1.00	2.00	1.25	1.25	1.15	1.15
Eastern Penn. and Northern N. J.	2.50	1.20	1.50	1.20	1.20	1.20	1.20
Western Penn.	2.50	1.25	1.50	1.25	1.25	1.25	1.25
CENTRAL:							
Ironton, Ohio		1.45		1.45	1.45	1.45	
Jackson, Ohio		1.30		1.30	1.30	1.30	
Toledo, O.	1.50	1.35	1.50	1.35	1.35	1.35	1.35
Youngstown, Dover, Hubbard, Leetonia, Struthers, O.	2.00	1.25	1.35	1.35	1.25	1.25	1.25
SOUTHERN:							
Ashland, Ky.		1.55		1.55	1.55	1.55	
Ensley, Ala.	2.05	.80	1.25	1.15	.90	.90	.80
Longdale, Goshen, Glen Wilton, Roanoke, Ruesens, Va.	2.50	1.00	1.25	1.25	1.25	1.15	1.15

Lime Products (Carload Prices Per Ton F.O.B. Shipping Point)

	Finishing hydrate	Masons' hydrate	Agricultural hydrate	Chemical hydrate	Ground burnt lime, Blk.	Ground burnt lime, Bags	Lump lime, Blk.	Lump lime, Bbl.
EASTERN:								
Bellefonte, Pa.		10.50*	10.50*	10.50*	9.00		8.50	1.80
Buffalo, N. Y.				12.00				
Berkeley, R. I.			12.00					2.30
Lime Ridge, Pa.							5.00a	
Williamsport, Pa.			10.00				6.00	
York, Pa. (dealers' prices)		10.50	10.50	10.50			8.50	1.65b
CENTRAL:								
Cold Springs, Ohio		11.00	10.00		9.00	11.00‖	10.00	
Delaware, Ohio	12.50	10.00	9.00	11.00			9.00	1.60
Gibsonburg, Ohio	12.50		10.50		9.00	11.00	10.00	
Huntington, Ind.		11.00	10.00		9.00	11.00	10.00	1.60c
Luckey, Ohio	12.50‡							
Marblehead, Ohio		11.00	10.00				10.00	1.60d
Marion, Ohio		11.00	10.00				10.00	1.80†
Mitchell, Ind.		12.00	12.00	12.00	11.00		10.00	1.70k
Sheboygan, Wis.							9.50	
Tiffin, Ohio					9.00			
White Rock, Ohio	12.50				9.00	11.00		
Woodville, Ohio	12.50‡	11.00‡	9.00‡		9.00		9.00	1.60
SOUTHERN:								
Erin, Ten.							8.50	1.50
El Paso, Texas							9.00	1.50
Graystone and Wilmay, Ala.	12.50	11.00		11.00@12.50			8.50	1.50
Karo, Va.							7.00	1.50
Puntenny, Ariz.					10.00h	.90i	9.50h	1.70j
Staunton, Va.							1.50	
Varnons, Ala. (l)	11.00	11.00	11.00	11.00	9.50	.67½g	8.50	1.50
Zuber and Ocala, Fla.	13.00	13.00	10.00			1.50	12.00	1.60
WESTERN:								
Colton, Calif.			15.00				19.70	
Kirtland, N. M.							15.00	
San Francisco, Calif.	22.00	22.00	15.00	22.00				2.50
Tehachapi, Calif.							15.00	2.25

*Paper sacks; †180-lb. net, non-returnable metal barrel; ‡50-lb. paper bags, terms 30 days net, 25c per ton or 5c per bbl. discount for cash in 10 days from date of invoice; (a) f.o.b. kilns; (b) 180 lb. net, 2.65, 280 lb. net; (c) wooden bbl; (d) wooden, 1.60, steel, 180; (e) wooden bbl., steel bbl., 2.20; (g) per bag of 90 lb.; (h) to 12.50; (i) to 1.00 90-lb. sack, 25c credit if returned; (j) to 2.10; (k) wooden bbl., steel 2.20; (l) dealers' prices.

Miscellaneous Sands

(Continued)

St. Louis, Mo.:	
Core	1.00@ 1.75
Furnace lining	1.50
Molding fine	1.50@ 2.50
Molding coarse	1.25@ 1.75
Roofing sand	1.75
Sand blast	3.50@ 4.50
Stone sawing	1.25@ 2.25
Traction	1.25
Brass molding	2.00@ 3.00
San Francisco, Calif.:	
(Washed and dried)—Core, molding fine, roofing sand and brass molding	3.00@ 3.50
(Direct from pit)	
Furnace lining, molding coarse, sand blast	3.60
Stone sawing, traction	2.30
Tamalco, Ill.:	
Molding coarse	1.40@ 1.60
Brass molding	1.75
Tamms, Ill.:	
Ground silica per ton in carloads	20.00@31.00
Thayers, Pa.:	
Core	2.00
Furnace lining	1.25
Molding fine and coarse	1.50
Traction	2.00
Utica, Ill.:	
Core (crude and dry)	.75@ 1.25
Furnace lining (crude and dry)	.65@ 1.25
Molding fine (crude and dry)	.65@ 1.25
Molding coarse (crude and dry)	.65@ 1.25
Roofing sand (fine and coarse)	1.25@ 2.25
Sand blast	2.25
Stone sawing	1.25@ 2.25
Traction	1.25
Brass molding	1.25
Warwick, Ohio:	
Core, furnace lining, molding fine and coarse, brass molding (all green), 1.75; all dry	2.75
Traction (dry)	2.75
Zanesville, Ohio:	
Sand blast	2.50
Core	2.00
Molding fine	2.00
Molding coarse	1.50
Furnace lining	2.00
Traction	2.00

Talc

Prices given are per ton f.o.b. (in carload lots only), producing plant, or nearest shipping point.

Baltimore, Md.:	
Crude talc (mine run)	3.00@ 4.00
Ground talc (20-50 mesh), bags	10.00
Cubes	55.00
Blanks (per lb.)	.08
Pencils and steel workers' crayons, per gross	1.25
Chatsworth, Ga.:	
Ground (20-50 mesh), ton	7.50
Ground (150-200 mesh), bags	8.00@12.00
Chester, Va.:	
Crude talc, per ton	4.00
Ground talc (150-200 mesh), bulk ton	8.00@ 9.00
Bags	9.00@10.00
E. Granville, Rochester, Johnson, Waterbury, Vt.:	
Ground talc (20-50 mesh) bags	7.00@10.00
Ground talc (150-200 mesh) bags	10.00@25.00
Pencils and steel workers' crayons, per gross	.75@ 2.00
Emeryville, N. Y.:	
(All air floated)—325 mesh, bags	14.75
150-200 mesh, bags	13.75
Henry, Va.:	
Crude talc (mine run) per 2000-lb. ton	2.75@ 3.50
Ground (150-200 mesh), bags	9.75@14.00
Keeler, Calif.:	
(150-200 mesh); carloads, 60,000 lbs. (bags extra)	20.00@30.00
Marshall, N. C.:	
Ground (20-50 mesh), ton	7.50
Ground (150-200 mesh), bags	8.00@12.00
Natural Bridge, N. Y.:	
Ground talc (300-325 mesh), 200-lb. bags	13.00@15.00
Waterbury, Vt.:	
Ground talc (20-50 mesh), bulk (Bags extra)	7.50@10.00
Ground talc (150-200 mesh), bulk (Bags extra)	10.00@22.50
Pencils and steel workers' crayons, per gross	1.20@ 2.50

Rock Phosphate

(Raw Rock)

Per 2240-lb. Ton

Centerville, Tenn.—B.P.L. 65%, bags	8.50
Bulk	6.50
Gordonsburg, Tenn.—B.P.L. 65-68%	4.50@ 5.50
Tennessee—F. O. B. mines, gross ton, unground Tenn. brown rock, 72% min. B.P.L.	5.50

(Continued on next page)

Roofing Slate

The following prices are per square (100 sq. ft.) for Pennsylvania Blue-Clay Roofing Slate, f. o. b. cars quarries:

Sizes	Genuine Bangor, Washington Big Bed, Franklin Big Bed	Genuine Albion	Slatington Small Bed	Genuine Bangor Ribbon
24x12	$10.20	$10.00	$8.10	$7.80
24x14	10.20	10.00	8.10	7.80
22x12	10.80	10.00	8.40	8.75
22x11	10.80	10.50	8.40	8.75
20x12	12.60	10.50	8.70	8.75
20x10	12.60	11.00	8.70	8.75
18x10	12.60	11.00	8.70	8.75
18x 9	12.60	11.00	8.70	8.75
16x10	12.60	11.00	8.40	8.75
16x 9	12.60	11.00	8.40	8.75
16x 8	12.60	11.00	8.40	8.75
18x12	12.60	11.00	8.70	8.75
16x12	12.60	11.00	8.40	8.75
14x10	11.10	11.00	8.10	7.80
14x 8	11.10	10.50	8.10	7.80
14x 7 to 12x6	9.30	10.50	7.50	7.80
	Mediums	Mediums	Mediums	Mediums
24x12	$ 8.10	$8.10	$7.20	$5.75
22x11	8.40	8.40	7.50	5.75
Other sizes	8.70	8.70	7.80	5.75

For less than carload lots of 20 squares or under, 10% additional charge will be made.

(Continued from preceding page)

(Ground Rock)

Mt. Pleasant, Tenn.—B.P.L. 65%; per 2000 lb. ton	7.00
Twomey, Tenn.—B.P.L. 65%	6.50@ 7.50

Florida Soft Phosphate

(Raw Land Pebble)

Per Ton

Florida—F. O. B. mines, gross ton, 68/66% B.P.L.	2.25
70% min. B.P.L.	2.50
72% min. B.P.L.	2.75
75/74%	3.75
Jacksonville (Fla.) District	10.00@12.00

(Ground Land Pebble)

Per Ton

Jacksonville (Fla.) District. Add 2.50 for sacks.	14.00
Morristown, Fla.—26% phos. acid	16.00

Fluorspar

Fluorspar—80% and over calcium fluoride, not over 5% silica; per ton f.o.b. Illinois and Kentucky mines	20.00@22.00
Fluorspar—85% and over calcium fluoride, not over 5% silica; per ton f.o.b. Illinois and Kentucky mines	22.00@23.50

Special Aggregates

Prices are per ton f. o. b. quarry or nearest shipping point.

City or shipping point	Terrazzo	Stucco chips
Barton, Wis., f.o.b. cars		10.50
Chicago, Ill.—Stucco chips, in sacks f.o.b. quarries		17.50
Easton, Pa.—Slate granules		6.50@ 7.00
Haddam, Conn. — Felstone buff	12.00	12.00
Harrisonburg, Va.—Blk. marble (crushed, in bags	12.50@18.00	12.50@18.00
Ingomar, Ohio (in bags)		6.00@25.00
Mertztown, Pa. (granite) bags, $10.00; bulk		8.00
Middlebrook, Mo.—Red		25.00@30.00
Milwaukee, Wis. (del.)		16.00@30.00
Newark, N. J.—Roofing granules		7.50
New York, N. Y.—Red and yellow Verona		32.00
Phillipsburg, N. J.—Evergreen, bulk	8.00@10.00	8.00@10.00
Creme and royal, bulk	15.00@20.00	15.00@20.00
Red Granite, Wis.		7.50
Sioux Falls, S. D.	7.50	7.50
Tuckahoe, N. Y.—2000 lb.		12.00
Wauwatosa, Wis.		14.00@34.00
Whitestone, Ga.—White marble chips, net ton in bulk, f.o.b. cars, granite	4.50@ 6.00	4.50@ 6.00

Concrete Brick

Prices given per 100 brick, f.o.b. plant or nearest shipping point.

	Common	Face
Appleton, Minn.	22.00	25.00@35.00
Carpenterville, N. J.	23.00	31.50@41.50
Ensley, Ala. ("Slagtex")	11.50	22.50@33.50
Friesland, Wis.	22.00	32.00
Omaha, Neb.	18.00	30.00@40.00
Portland, Ore.	21.00	30.00@60.00
Puyallup, Wash.	20.00	30.00@90.00
Rapid City, S. D.	18.00	25.00@40.00
Salem, Ore.	23.00	35.00@75.00
Watertown, N. Y.	18.00@21.00	32.00@35.00
Wauwatosa, Wis.	14.00@15.00	28.00@75.00
Winnipeg, Can.	15.50	

Sand-Lime Brick

Prices given per 1000 brick f. o. b. plant or nearest shipping point, unless otherwise noted.

Barton, Wis.	10.50
Boston, Mass.	15.00@16.50
Dayton, Ohio	12.50@13.50
Grand Rapids, Mich.	11.00
Jackson, Mich.	13.00
Lancaster, N. Y.	13.00
Michigan City, Ind.	11.00
Milwaukee, Wis. (delivered)	13.00
Plant City, Fla.	10.00@15.00
Portage, Wis.	15.00
Rives Junction and Saginaw, Mich.	12.00
Saginaw, Mich.	12.00
San Antonio, Tex.	12.50@13.50
Syracuse, N. Y. (delivered at job)	15.00@16.00
F.o.b. cars	17.00

Gray Klinker Brick

El Paso, Texas	13.00

Lime

Warehouse prices, carload lots at principal cities.

	Hydrated, per ton Finishing	Common
Atlanta, Ga.	22.50	14.00
Baltimore, Md.	24.25	17.85
Cincinnati, Ohio	16.80	14.30
Chicago, Ill.	20.00	20.00
Dallas, Tex.	20.00	.....
Denver, Colo.	24.00	.....
Detroit, Mich.	22.00	20.00
Minneapolis, Minn. (white)	25.50	21.00
Montreal, Que.	.....	21.00
New York, N. Y.	18.20	13.10
St. Louis, Mo.	24.00	20.00
San Francisco, Calif.	22.60	.....
Seattle, Wash. (paper sacks)	24.00	.....

Portland Cement

Prices per bbl. and per bag net in carload lots.

	Per Bag	Per Bbl.
Atlanta, Ga.	.....	2.60
Boston, Mass.	.....	2.63†
Buffalo, N. Y.	.....	2.48†
Cedar Rapids, Iowa	.....	2.40
Cincinnati, Ohio	.....	2.47
Cleveland, Ohio	.....	2.39
Chicago, Ill.	.....	2.20
Columbus, Ohio	.....	2.44
Dallas, Texas	.53¾	2.15
Davenport, Iowa	.....	2.39
Dayton, Ohio	.....	2.48
Denver, Colo.	.63¾	2.55
Detroit, Mich.	.....	2.40
Duluth, Minn.	.54¾	2.25
Indianapolis, Ind.	.....	2.41
Kansas City, Mo.	.64¼	2.37
Los Angeles, Cal. (less 5c dis.)	.60	3.08
Memphis, Tenn.	.....	2.60
Milwaukee, Wis.	.....	2.35
Minneapolis, Minn.	.60½	2.42
Montreal, Canada (sks. 20c ext.)	.....	1.90b
New Orleans, La.	.....	2.90
New York, N. Y.	.....	2.25†
Philadelphia, Pa.	.....	2.41†
Phoenix, Ariz.	.82½	3.30
Pittsburgh, Pa.	.....	2.19
Portland, Ore.	.....	3.05
San Francisco, Cal.	.....	2.61*
St. Louis, Mo.	.57½	2.30
St. Paul, Minn.	.60½	2.42
Seattle, Wash. (10c bbl. dis.)	.....	2.90
Toledo, Ohio	.....	2.45

NOTE—Add 40c per bbl. for bags.
*5c cash disc. 10 days.
†Prices to contractors, including bags.
(b) Less 10c 20 days.

Mill prices f. o. b. in Carload Lots to Contractors

	Per Bag	Per Bbl.
Buffington, Ind.	.48¾	1.95
Concrete, Wash.	.....	2.60
Dallas, Texas	.....	2.10
El Paso, Tex.	.70	2.08*
Hannibal, Mo.	.....	1.95
Hudson, N. Y.	.....	2.05
Leeds, Ala.	.....	1.95
Los Angeles, Calif.	.....	2.65
Louisville, Ky.	.....	2.35
Northampton, Pa.	.....	1.95
Phoenix, Ariz.	.....	4.30†
Steelton, Minn.	.50	2.00
Universal, Pa.	.48¾	1.95

*Gross, 10c sacks and 10c per bbl. disc 10 days.
†Gross, 15c sacks and 5c per bbl. disc. 10 days.

Gypsum Products—CARLOAD PRICES PER TON AND PER M SQUARE FEET, F. O. B. MILL

	Crushed Rock	Ground Gypsum	Agricultural Gypsum	Stucco Calcined Gypsum	Cement and Gauging Plaster	Wood Fiber	White Gauging	Sanded Plaster	Keene's Cement	Trowel Finish	¼x32x36" Plaster Board Weight 1500 lb. Per M Sq. Ft.	⅜x32x36" Plaster Board Weight 1850 lb. Per M Sq. Ft.	Wallboard, ⅜x32 or 48" Lengths 6'-10', 1850 lb. Per M Sq. Ft.
Agatite, Texas (a)	.....	.....	6.00	10.00	10.00	10.50	10.00	.....	19.00	.....	.....	.....	.....
Akron, N. Y. (a)	3.00	4.00	6.00	10.00	10.00	10.00	20.20	7.00@9.00	27.35	21.00	19.375	20.00	30.00@32.00
Black Hawk, S. D.	3.50	.....	7.00	8.00	10.00	10.50	.....	.....	.....	.....	.....	.....	.....
Blue Rapids, Kans. (a)	2.50	4.00	6.00	10.00	10.00	10.50	10.00	.....	23.15	19.00	19.375	20.00	.....
Denver, Colo.	.....	.....	.....	11.80	.....	.....	.....	.....	.....	.....	.....	.....	.....
Douglas, Ariz.	.....	.....	6.00	.....	15.00	.....	.....	.....	.....	15.50	.....	.....	.....
Ft. Dodge, Iowa (a)	2.50	4.00	6.00	10.00	10.00	10.50	15.45	.....	22.70	20.00	19.375	20.00	30.00
Grand Rapids, Mich.	2.75	.....	6.00	10.00	10.00	10.00	.....	.....	.....	.....	20.00	21.00	30.00
Gypsum, Ohio (a)	2.75	4.00	6.00	10.00	10.00	10.00	19.25	7.50	26.85	19.00	19.375	20.00	30.00
Port Clinton, Ohio	3.00	4.00	6.00	8.00	10.00	10.00	.....	7.50	30.15	.....	.....	20.00	30.00
Portland, Colo.	.....	.....	.....	10.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Francisco, Calif.	.....	12.00	12.00	15.40†	.....	.....	16.40‡	.....	.....	.....	.....	.....	.....
Winnipeg, Man.	5.50	5.50	7.00	13.50	15.00	15.00	.....	.....	.....	.....	28.50	.....	35.00

NOTE—Returnable Bags, 10c each; Paper Bags $1.50 per ton extra (not returnable).
†CL.; LCL., $16.50; ‡finishing. CL.; LCL., $17.50; (a) prices are net of bags.

Book Review

An Exhaustive Treatise on Sands

SANDS AND CRUSHED ROCKS. By Alfred B. Searle, Consulting Expert on Rocks and Rock Products, Sheffield, England. Two volumes. Cloth, about 800 pp., well illustrated. Published by Henry Frowde and Hodder & Stoughton, 1 Bedford St. Strand W. C. 2, London, England.

This is certainly the most complete work in sands that has come to the reviewer's attention. Starting with the geology of sands, (mainly, confined to English deposits) it goes on to describe more kinds of sand than many sand producers know of. In America when we speak of sands we usually confine the term to the natural sands of fluvial or glacial origin, mainly silicious, and to silica sands, either uncemented or in the form of sandstone. But Mr. Searle has been more generous and has included sandy forms of iron ore, emery, cobalt sands, diatomaceous earth, gold placer sands, etc., etc., and such artificial sands as carborundum and siloxicon. We do not object to this, in fact it is a convenience to have all these substances described together, and the book has already proved its value as a reference work on this account.

The properties of sands, physical and chemical, are exceptionally well treated, these properties and the methods of testing occupying a fair proportion of the first volume. Some of the testing methods and classifications will posibly be new to American readers. The section on the properties of refractory sands is especially good, as it includes the effect of various impurities and a study of the effect of heat on silica. The settling of sands in water is fairly well treated. One is glad to find in this testing section the method of testing by chemical solutions of different specific gravities, by which such minerals as lignite may be quantitatively separated from sand. There are some good tables in this section.

But the sections which follow this and which describe the actual production and preparation of sands for the market seems incomplete to one familiar with American practice. Prospecting is touched upon but there is no mention of the familiar method of using a small orange peel bucket in a pipe. The scheme of operating a pit is treated only in the most general way. Excepting the steam shovel, which is called a "steam navvy" in Britain, and the locomotive crane with grab bucket, excavating machines are scantily treated. There is no mention of the (boom) dragline excavator and none of the slack line cableway excavator, which is perhaps more used than all the other machines in the United States. There is a meager mention of the scraper bucket, the use of which is confined to small operations on this side of the Atlantic, and the centrifugal pump dredge gets only a half page.

Quarrying silica sand rock is much better handled. It is interesting to note that the "wave transmission" machines for rock drilling are mentioned as standard machines, although in this country they have never got beyond the experimental stage.

Dealing with the preparation of sands (washing, classifying, drying, etc.), Mr. Searle has written a valuable treatise on crushing, grinding, washing, drying and concentrating machines and their use. Some of the devices he mentions are almost obsolete and others have never met with much favor in this country (the wash mill, for example), but perhaps it was well to include all these forms for the sake of completeness. The principles of washing and their application are well handled.

The second volume treats of the uses of sands and discusses their use in brickmaking, as fine aggregate in concrete, in plasters and as refractory materials and molding sands and the like. Since by far the greatest use of sand, in the United States, is its use in concrete, one naturally turns first to that chapter. And it is astonishing to find nothing regarding Professor Abrams work and the application of the modulus of fineness. The method of designing concrete which has been worked out by Professor Abrams has been so thoroughly indorsed by the Portland Cement Association and has been applied in so many important concrete structures that the reason for its omission is hard to conceive. It can only be conjectured that this part of the book was written before Professor Abrams' work had received the publicity and the endorsement of engineers that has been given to it in the last year or two.

The remaining chapters on the uses of sand will well repay reading and may contain some valuable hints for sand producers for disposing of surplus production.

Mr. Searle is a well recognized authority on the subject of which he treats. He is perhaps better known on this side of the Atlantic than any other British writer on rock products, on account of the many valuable articles he has contributed to technical journals. And he has written a most valuable book of the sort that every producer of building sands, silica sands and like materials will do well to read and to keep for use as a reference book. The users of such materials as molding sands, refractory sands and the like will also find it worth while. And it should certainly be in the library of every laboratory in which sands are tested both for their characteristics and for their adaptation to new uses.—E. S.

Sampling Aggregates

THE requirements for both fine and coarse aggregate are usually definitely established by the specifications and, in a general way, laboratory tests made before the job is started, determine the suitability of materials taken from available sources of supply. But these precautions do not relieve the inspector of responsibility in the matter of aggregates. It is his duty to see that the materials as delivered on the job meet the intent of the specifications. He must control the quality of the materials throughout the progress of the job.

To do this, more than a superficial inspection is needed. It is not enough merely to take a handful of sand or pebbles, rub it between your fingers and then pass judgment. Certain easily performed field tests will provide a fairly reliable standard of comparison, and, if the quality of the material is still in doubt, a representative sample should be sent to the laboratory.

It is important that the fine aggregate be well graded in size. An excess of fine material passing the 100-mesh sieve gives rise to difficulties. More mixing water is required; the strength of the resulting concrete is reduced and the surface texture of the pavement is affected. Five per cent should be the limit for material passing the 100-mesh sieve. Frequent sieve analyses are necessary to control this.

Field tests of materials ought to be supplemented by laboratory tests, especially when the suitability of the material is in doubt and when new sources of supply are tapped. When sampling materials for laboratory tests, care must be taken to obtain a representative sample. The size of the sample will, of course, depend on the nature of the material and on the scope of the tests to be made. Generally a sample of fine aggregate should contain not less than 50 lb. and a sample of coarse aggregate not less than 100 lb. The sample sent to the laboratory should be taken from a selected sample four times as great and reduced by quartering, i.e., by thoroughly mixing, dividing into quarters and eliminating diagonal quarters. This operation is repeated until the sample is reduced to one-quarter its original size.

In sampling the open face of a pit, the best method is to scoop vertical troughs at equal intervals along the face, placing the material taken from each trough on a canvas and quartering it down to the desired size.

When samples are taken from loaded cars it is necessary to do a considerable amount of digging to obtain a sample representative of the material in the car. A good method is to dig a hole 2 or 3 ft. deep at several points in the car and, starting at the bottom of each hole, drag the point of the shovel up the side. The samples thus taken from each hole should then be mixed and the composite sample quartered down.—*Concrete Highway Magazine.*

New Machinery and Equipment

The Orton & Steinbrenner Truck Crane

THE Orton & Steinbrenner Dependable Truck Crane combines the well known advantages of a crane with the speed of a motor truck, according to its makers.

It is full revolving—swings completely around in a full circle. On account of this fact it can lift heavier loads at longer distances without danger of the truck tipping over.

The crane can be mounted on any new or second-hand truck of five tons capacity, having a distance back of the driver's seat of 8 ft. to the center of the rear axle, although the machine is more evenly balanced if this distance is 8 ft. 6 in. Practically all late models of five-ton trucks are of this distance and 90% of the old models are, so that practically no remodeling or rebuilding of the truck is necessary.

An exclusive feature of it is the removable counterweight compartment. As the laws of some states do not permit loads in excess of 10 tons to travel over hard surfaced roads, the ballast which is necessary to maintain the balance may be dropped out by simply opening the bottom of the compartment. Sand is generally used for ballast and, of course, is readily obtainable anywhere at practically no cost.

For convenience and ease of operation the operating levers are banked on one side in front, the operator having a complete and unobstructed view of the work at all times. The general arrangement of the drums, gears and shafts is similar to that used on Orton & Steinbrenner locomotive cranes for the past 20 years and proved by the test of time.

The construction of the Orton & Steinbrenner "Dependable" truck crane is practically identical with the larger types of cranes. All wearing surfaces and bearings are bushed with removable bronze bushings. The drums and sheaves are of large diameter and easy on cable. The frictions for operating the hoisting drums and swinging are bronze cone with outside band brakes. The main train of spur gears are cut steel. In fact, all gears are steel. The shafting is forged and turned. Practically the entire crane structure is either cast or structural steel. All parts are manufactured on the duplicate part system, which insures a perfect fit. Greasing and lubricating is provided for by "Alemite" pressure system.

The turntable is a massive steel casting revolving on four large steel rollers. The "A" frame supporting the boom is structural steel amply riveted and braced.

Either a full steel cab with ample sash and doors is supplied or a canopy with canvas side curtains.

The power is furnished by a heavy duty "Hercules" motor with four cylinder 4x5 ft. stroke, giving 37 hp. Motor accessories include a Stromberg carburetor, a "twin disc" clutch, extra large "Perfex" radiator, high tension magneto with impulse starter and gas tank of 30 gallons capacity.

Double drums are furnished on the main drum shaft, and power is supplied to both so that in bucket handling work the bucket may be hoisted while open as well as closed.

New truck crane

This feature is exclusive with the Orton & Steinbrenner truck crane.

With a generating set it can operate a 36-in. electro magnet and handle scrap iron, pig iron or castings around a foundry; with a hook and sling, handle logs or erect structural steel buildings. In fact, it will do anything a larger crane can do within its lifting capacity and with the added advantage of being able to travel from point to point quickly and not being limited to tracks. It goes anywhere a motor truck can go.

Westinghouse Develops Oil Circuit Breakers with New Features

THE Westinghouse Electric and Manufacturing Co. has developed a line of indoor service electrically operated oil circuit-breakers, in which are incorporated several new and distinctive features. These breakers are three pole, single throw, either non-automatic or automatic in operation, for capacities up to 2000 amperes and alternating current voltages up to 25,000 with interrupting capacities at the rated voltage of approximately 9500 and 13,000 amperes respectively. They are particularly adapted to the control of alternating-current circuits of large capacity where the voltage does not exceed 25,000 volts. Each of the two forms, CO-11 and CO-22, has a different maximum interrupting capacity, but the details of construction are similar.

The two outstanding features in the construction of this type of breaker are its compactness and its ease of installation. The oil tanks of the CO breakers are seamless and die-pressed from heavy sheet steel. They are so fastened to the steel top that an oil tight joint is secured. Each tank is equipped with a muffler, so that when the breaker opens a heavy short circuit, the air in the top chamber is forced out through the muffler in advance of the arc gases rising through the oil; this eliminates the possibility of a violent explosion in the breaker structure due to the mixture of oxygen and arc gases. The rupturing capacity and the severity of the duty cycle which a given breaker structure will handle are thereby greatly increased. To prevent arcing between contacts and tanks, a set of removable flame resisting insulating linings is used in each tank. The inner layers of these linings are of asbestos; the outer layers, of micarta. Re-entrant type oil gages indicate the oil level in each tank.

These breakers have efficient, self-cleaning parallel path type of high pressure laminated brush main contacts, especially adapted to heavy power systems, due to the fact that contact pressure is increased through the attraction of the current flowing in the same direction in parallel paths. The main contacts are protected by extra heavy arcing contacts.

The CO breaker is operated by a unit type solenoid mechanism mounted above the poles on the top of the steel bed plate forming the cell top. After the breaker is closed by the solenoid, it is held in the closed position by a hardened steel latch with which a trigger engages automatically. The oil circuit breaker is equipped with a special control relay panel which is provided with a two piece contact arm and release coil. As soon as the circuit breaker is closed by the operator in the usual manner, the pallet switch on the breaker energizes the release coil of the control relay. This release coil opens the contact of the control relay, irrespective of the fact that the operator may hold the control switch in the closed position and thus still be energizing the main control coil of the control relay. By the use of this special control relay, full automatic protection can be secured where the breaker is used in connection with overload relays and current transformers.

News of All the Industry

New Incorporations

Monterey Sand and Gravel Co., Monterey, Calif. Capital $300,000.

Eden Gravel Co., Upper Sandusky, Ohio; $25,000; L. A. Kueneli and Frank Althouse.

Manistee Sand Co. has been incorporated in Manistee, Mich., with a capital stock of $10,500.

South Seattle Sand Service of Seattle, Wash.; capital stock $3000; Charles J. Hutchinson and O. H. McGill.

Dakota Granite Co., Sioux Falls, S. D.; capital $25,000; incorporators, Fred A. Brown, Minnie Brown, D. V. Kirby.

Stonehenge Granite Co. has been incorporated in Denver, Colo., with a capital of $1,000,000, by S. M. Ryan, L. A. Mae and R. Peete.

Watauga Cement Products Co. of Bristol, Va., has filed an amendment to its charter increasing its capital stock to $50,000 from $20,000.

Dougherty Sand and Gravel Co., Ardmore, Okla. Capital $25,000. Incorporators: E. F. Holmes, E. R. Ballinger and V. L. Gray, Ardmore.

Star Sand and Gravel Co. has been incorporated in Los Angeles, Calif., with a capital stock of $50,000, by John H. Rice, E. A. Wolfe and Mabelle B. Rice.

Tacoma Lime Co.; capital stock $275,000; incorporators, J. M. Bean, H. W. Jaeger, W. C. Meacham, B. W. Meacham and Conrad Gaard, Tacoma, Wash.

Davenport Concrete Products Co. has been incorporated in Davenport, Iowa, with a capital stock of $20,000, by Henry Thuenen, 1804 East 12th street, and others.

Indianapolis Oolitic Stone Co., a Delaware corporation, qualified in Indiana; capital in that state $300,000; to quarry and deal in stone; agent, Milton L. Clawson, Indianapolis.

George H. Noone Sand and Gravel Co., Boston. Filed May 23, 1924. $50,000; 50 shares $1000 each. President, George H. Noone; treasurer, Ava M. Noone, 28 Nobscot road, Newton Center, and Ada C. Stoddard.

Fairbanks Exploration Co., Portland, Maine; capital, 5000 shares non-par. President, P. E. Coyle; treasurer and clerk, H. P. Sweetster. Purpose, to explore, control and operate mines, quarries and mineral rights.

Marquette Stone Co. has been incorporated in McGregor, Iowa, with a capital stock of $40,000. John Kramer of McGregor is president and G. H. Dahmen of Marquette is vice-president. The company will operate a quarry.

Lewiston Portland Cement Co. has been organized under the laws of Montana. The capital stock is shown to be $50,000, all subscribed. Of this amount C. A. Reid, Lewiston, subscribed $44,400; J. Fred Smith, Arlington, Wash., $5000, and other stockholders subscribed $100 each as follows: W. H. Tierney, Everett, Wash.; Engineer J. C. Ralston, Spokane; J. U. McPherson, Lewiston, and H. S. Hepner, I. W. Choate and Reena S. Blackman, Helena, Mont. The three last were identified with the legal work of incorporation. The company has opened offices in the Idaho Trust building, Lewiston, Idaho.

Sand and Gravel

Indiana Gravel Co. has installed a new cylindrical steel hopper bin for loading trucks.

Enwood Sand Co. is to install new equipment for modernizing their plant at Roseville, Calif.

Frank Wilson, Jr., of Birmingham, Ala., is reported to have acquired the plant of the Louisiana Gravel Co. on the Eatonville road.

Burnham Co., Glenwood Ark., is completing plans for a 10-car gravel pit and will install washers, screens, conveyors, clam shell buckets, cables, etc.

Consumers Rock and Gravel Co., 2600 South Alameda street, Los Angeles, Calif., is about to begin the construction of a $5000 sand bin at 7301 Pacoima avenue.

Independent Rock and Sand Co., 913 San Fernando road, Burbank, Calif., is putting in a $15,000 sand bin on the south side of Pendleton street, near Remsen, in San Fernando Annex.

Star Sand and Gravel Co. will purchase about $20,000 worth of machinery for their plant which is being established in the San Fernando valley near San Fernando, Calif. John H. Rice is president of the company.

Clare Rock and Gravel Co., 3326 San Fernando road, San Fernando, Calif., has let the contract for construction of a rock storage plant on the south side of McBroom avenue, between Wheatland and Claybourn streets, San Fernando Annex.

A carload of sand from the pits on the C. N. Boyd farm east of Sheffield, Ill., is to be shipped to Chicago for final tests. All preliminary tests have proved that the sand on this estate is of the very best quality for molding and if the carload lot comes up to standards, in all probability the sand will be shipped in large quantities.

California Rock Co., Niles, Calif., is reported to have secured the old J. J. Scribner place on the Pleasanton-Livermore highway. The property extends from the highway to the Arroyo Del Val and adjoins the property owned and operated by the Coast Rock and Gravel Co. that is now developing its plant to the extent that it will soon be one of the largest in the state.

Good Roads Gravel Co., Newark, Ark., who has supplied the surfacing material for a number of Arkansas highways, is expecting a big demand for its product this season, according to reports which state that the demand is increasing each week, owing to the large number of new highway projects under way in the state.

Quarries

Kenneth Casparis, who was formerly with the Comal Stone Co. of New Braunfels, Texas, is now with the Casparis-Ohio Quarries Co., Melvin, Ohio.

J. J. Ford of Claremont, Calif., has purchased a 63-acre tract of land near Upland and will establish a rock crushing plant there to cost about $250,000.

C. A. East has acquired the quarry, including 80 acres of land, at Rock Springs, near Glencoe, Ala., from the Woodstock Iron Corp. and will develop same.

Santee, Calif.—Hosmer McKoon is developing a granite quarry about three miles north of here which is expected to be in operation about the first of July.

Kiggins Quarry Co., whose plant is west of Hillsboro, Ill., began operations on May 27. George Gruhl of Hamilton, Ohio, has been employed as superintendent of the plant. The work of cleaning up the plant and getting ready to operate will require about 15 days and thereafter production will start.

Cement

Lewiston Portland Cement Co. has opened offices in the Idaho Trust building, Lewiston, Idaho, and proposes to install a cement plant at Orofino.

Arkansas Valley Portland Cement Co. has purchased 500 acres of land at Stone City, Colo., and plans establishing a cement plant at Carlisle Springs.

San Antonio Portland Cement Co., San Antonio, Texas, is soon to let the contract for erection of 10 slurry tanks for the plant at Cementville to cost about $75,000.

William Wallace Meins of San Francisco, Calif., is organizing a company in that city, to operate as Crown Cement Syndicate, and to construct a $2,000,000 portland cement plant in San Andreas, in Calaveras county.

Gypsum

Universal Gypsum Co., Chicago, Ill., has opened an office in Atlanta, Ga., in the Allen building, with W. M. Stolz in charge as manager of sales for the Southeastern division. A Southwestern office has been opened in St. Louis, Mo., with Ray C. Haynes in charge.

Concrete Products

Cement Products Co., Davenport, Iowa, is building an addition to its plant which will include office space.

Florida Marble and Granite Co., Miami, Fla., is about to erect a 50x90-ft. building on North Miami street.

Banner Rock Products Co., Alexandria, Ind., was partially burned recently, according to reports, but little damage was done.

Concrete Products Manufacturing Co. is the name of a new concern at Brentwood, Mo. Modern equipment is being installed in the plant.

Fred W. Young, Crosley, Minn., has sold his plant for the manufacture of concrete building units to J. A. Christenson, of Minneapolis.

National Concrete Manufacturing Co., Cumberland, Md., of which Milleran Stock, New York, is president, is reported as erecting a $50,000 plant.

Erie Cement Products and Supply Co. plant at Toledo, Ohio, was wrecked by vandals recently. It is the second time this year that the plant has been wrecked that way.

E. S. McGrath and Perry F. Brown, of Northampton, Mass., have begun the manufacture of cement blocks. Their new plant has a capacity of 1000 blocks per day.

Home Builders Supply Co., Logan's Crossing, Pa., has installed an automatic block machine which will bring the capacity of the plant to 5000 blocks per day.

Palmetto Concrete Mfg. Co., Lincoln and Rice streets, Columbia, S. C., of which T. Keith Legare is manager, will enlarge its plant and install 4 to 48-in. pipe making machinery.

C. W. Minick, New Castle, Ind., has placed a power shovel in operation at his gravel plant on the Greensboro road. The shovel, which is being used to take the dirt off the veins of gravel, is said to have cost about $12,000.

Standard Cement Construction Co., Louisville, Ky., of which J. D. Walker is general manager, will erect a modern plant in Louisville for the manufacture of sewer pipe and concrete culverts. The company also has a plant at Wilmington, N. C.

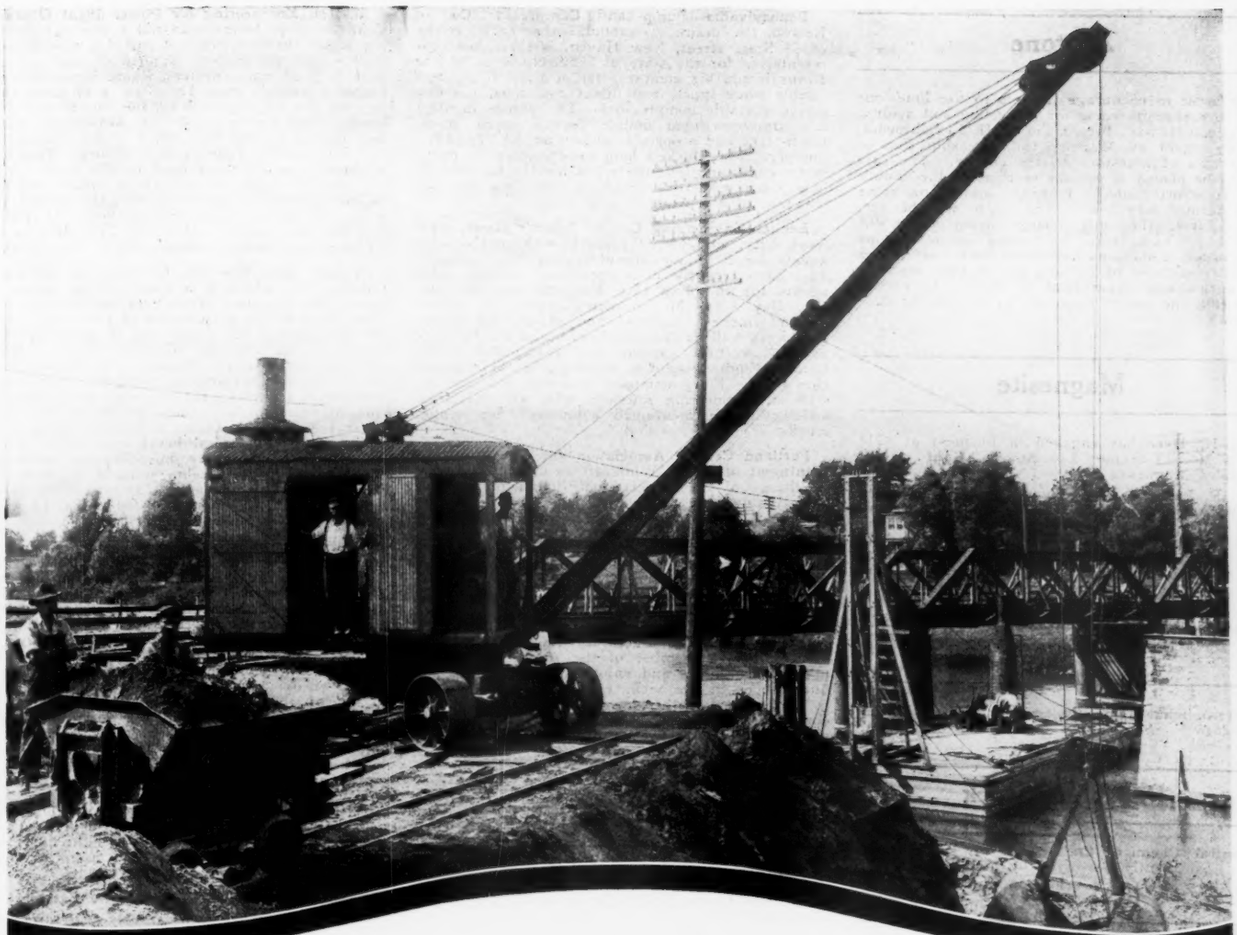
Trinity Concrete Products Co., of which Alfred Cheney is manager and chief engineer, will remodel and relocate its plant in Kinston, N. C., having machinery with capacity of 300 blocks, 3000 building tile and ornamental stone work to order per day.

Cincinnati Concrete Products Association was recently formed at Cincinnati, Ohio. The following officers were elected: S. I. Crew of the Norwood Concrete Block and Construction Co., president; Mr. Forste of the Oakley Concrete Block Co., vice-president, and Charles Gubser, Jr., secretary-treasurer.

J. Edward Schaden, 1030 Third street, Catasauqua, Pa., formerly connected with the Industrial Limestone Co., has organized the Industrial Cement Products Co., to operate a plant at Steuben, Northampton county, for the manufacture of cement bricks and blocks. The initial plant, on which work has been started, will have a capacity of 10,000 pieces per day.

Campbell-Whitaker cement block plant at Miami, Fla., estimates the output of the yard for this year at 1,250,000 cement blocks. The raw materials used are canal rock screenings—of which there is an inexhaustible supply here at hand—and cement. Mr. Whitaker states that this plant is the largest manufacturing consumer of cement in Miami, and that its cement consumption for the first four months of the present year was 36,420 sacks.

The first convention of the newly organized Concrete Products Association of Texas were held in Houston, June 13 and 14. The new body is affiliated with the National Concrete Products Association. Temporary officers and directors are: N. A. Eppes of Houston, president; George Willig of Waco, vice-president; E. C. Vickers of Dallas, secretary-treasurer; George Worthington of San Antonio, O. A. Neuman of Gonzales, Hannibal Pianti of San Antonio, W. B. Landes of Beaumont, W. A. Currie of Dallas, M. Turman of Fort Worth, I. H. Roberts of Wichita Falls and Fred Simon of Waco, directors.



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Agstone

In order to encourage farmers to use limestone and to realize its value for correcting soil acidity, arrangements have been made by H. E. Schroeder, county agent at Muncie, Ind., to ship five or more cars of limestone to the county. The cars are to be placed in various sections of the county and an effort made to limit the amount of stone each farmer may take. The stone will be furnished free, the only charge being made for freight. A number of soil testing demonstrations of acid soil conditions have been made this spring in many sections of Indiana and in each instance the agricultural department at Purdue University is urging the use of limestone to correct the condition.

Magnesite

H. H. Dyer has engaged in business at 4111 South Moneta avenue, Los Angeles, Calif., as the Hercules Magnesite Co.

H. R. Palmer of Los Angeles and Roy Gleason of San Francisco, Calif., are making a preliminary survey of the territory back of Coalinga, Calif., where they have secured a tract of land containing a large magnesite deposit, known as the Simpson Peak magnesite, and intend to erect a plant and develop the deposit at once.

Lime

International Lime Co., Sumas, Wash., is reported to be preparing to open up its fourth kiln.

Phosphate Rock

Central Chemical Co.'s plant at Hagerstown, Md., was recently destroyed by fire. Loss $175,000. It is expected the plant will be rebuilt.

Personals

Robert N. Miers, purchasing agent of the Texas Portland Cement Co., was elected vice-president of the National Association of Purchasing Agents at the national convention held in Boston, May 20-24. He will serve as vice-president, representing district No. 2, comprising Denver,, Tampico, Tulsa, St. Louis, Kansas City, New Orleans, Atlanta, Fort Worth, Houston and Dallas.

D. S. MacBride, Philadelphia district engineer of the Portland Cement Association, resigned May 27 at a testimonial dinner in the Manufacturers Club given by nearly 100 highway and structural engineers from the middle Atlantic states. Mr. MacBride's resignation became effective June 1, when he will become associated with the International Cement Corp. of New York. L. N. Whitecraft, who has been in charge of the association's work in New Jersey, will succeed Mr. MacBride in the Philadelphia office.

Trade Notes

Denver Rock Drill Mfg. Co. has opened a branch at 817-825 Washington boulevard, Chicago, where they will carry a full line of drills, spare parts and accessories.

Northwest Engineering Co. announces that the George B. Curd Equipment Co., with a main office at Cincinnati and district offices at Indianapolis and Lexington, Ky., will now handle the sales of Northwest gasoline convertible cranes, draglines and shovels in that territory.

W. W. Sly Manufacturing Co. has recently sold the Dexter Portland Cement Co., Nazareth, Pa., a 16-ft., type A Sly dust arrester, which is to be added to the number of these arresters this company already has in service for collecting dust from their bagging and packing plants.

Hammond Bag and Paper Co., Wellsburg, W. Va., has built a new paper mill at Wellsburg for manufacturing a high grade waterproof paper that meets the requirements for cement, lime, plaster and gypsum sacks. Mr. Hammond, who developed the process by which this waterproof paper is made, has had 35 years experience in the business.

Pennsylvania Pump and Compressor Co. of Easton, Pa., desires to announce that L. D. Burke of 68 Starr street, New Haven, is their sole representative for the state of Connecticut to handle Pennsylvania air compressors, in both single and double stage types, and direct connected gasoline driven portable compressors. The pumps handled are the centrifugal double suction single stage, multi-stage and a portable known as the "Penway" pumper. Mr. Burke's long experience as a pneumatic engineer particularly fits him to handle and help solve industrial problems involving the application of compressed air service.

Lenher Engineering Co., 95 Liberty street, New York City, who for 20 years have been the sales agents for S. Flory Manufacturing Co., Bangor, Pa., have recently been appointed Eastern sales agents for the Bay City Foundry and Machine Co., Bay City, Mich., manufacturers of power driven winches, capstans and cranes for motor trucks, as well as deck auxiliaries and the "Dreadnaught" vertical capstan and car puller. The Lenher Engineering Co. continues its representation of the Flory company and has added to its staff an engineering salesman who will specialize on the above mentioned equipment for motor trucks.

Portland Cement Association announces the appointment of L. N. Whitcraft as district engineer in charge of the association's Philadelphia office, 1315 Walnut street, effective June 4. Mr. Whitcraft has been connected with the Portland Cement Association for eight years as field engineer attached to the New York office. For several years past he has been in charge of association work in New Jersey. Prior to joining the Portland Cement Association staff he was county road engineer for Somerset county, Maryland, and chief engineer of the Hydrated Lime Bureau of the National Lime Manufacturers Association. Mr. Whitcraft is a member of the American Society of Civil Engineers and enjoys such a host of acquaintances in the vicinity of his new duties as to hardly need further introduction. He will welcome a continuance of the many opportunities which have always been afforded our Philadelphia district office to render public service.

Trade Literature

Zelnicker's Bulletin 320, issued by the Walter A. Zelnicker Supply Co., St. Louis, describes compressors and other equipment on hand for immediate delivery.

Taylor-Wharton Iron and Steel Co.'s engineering department (High Bridge, N. J.) has issued an excellent booklet on the uses and qualities of Tisco steels.

Traylor Engineering and Mfg. Co. has issued an excellent catalog of ball mills. A unique and very useful feature is a number of suggested flow sheets for various uses of these mills.

Austin Portable Belt Conveyors is a new bulletin issued by the Austin Manufacturing Co., Chicago. Both gas engine and electric drive loaders are described.

American Blower Co. (Detroit) issues its Bulletin 1613 on Ventura disc fans. This not only describes the fans but gives important information on their uses, especially in connection with motors.

Union Chain and Manufacturing Co. of Sandusky, Ohio, issues a very complete catalog of its products, No. 24-A. It contains excellent practical suggestions as to how to choose the chain one should buy and also how to prolong the life of chains.

Waughammers is the title of a neat catalog issued by the Denver Rock Drill Manufacturing Co. (Denver, Colo.) which describes the light weight hammer drills made by this company. Some pages are given to the Waugh "stopers," drill sharpeners and similar machines.

Jeffrey Coal and Ash Handling Machinery is the subject of Catalog No. 385 issued by the Jeffrey Manufacturing Co., Columbus, Ohio. This is a bound book of 212 pps. beautifully printed and illustrated. The data on belt conveyors and elevators are equally applicable to the sand and gravel and crushed stone industry.

Celite Products Co., Chicago, has issued several new bulletins on their products for the insulation of boilers and other heated equipment. Bulletin B-6e on "The Insulation of Boilers" describes in detail the method of insulating employed for various types and sizes of boilers, as well as figures on the fuel savings which can be realized by insulation. Blueprint Set B-16b contains charts on conductivities, as well as drawings showing the method of insulating various types of heated equipment. Several other bulletins have just been published, among them being Bulletin B-8d on "The Insulation of Industrial Furnaces and Ovens."

Modern Engineering for Power Plant Operators is an excellent little book (not a catalog) describing steam turbines, uniflow engines, high pressure boilers and the various appliances such as condensers, feed water heaters, steam separators, mechanical stokers, etc. There are very good chapters on the oil engine both the Diesel and other forms. The author is W. H. Wakeman, who is well known for his Manual of Steam Engineering and Engineering Practice and Theory. This book is almost a model for a book of this kind, that is, one that presents the subject in simple and non-technical language and yet covers the ground very well. The illustrations are excellent. It will be sent free on request to the New York Belting and Packing Co., 91-93 Chambers street, New York.

William Ganschaw Co., Chicago, Ill., has issued Catalog 100, which is a handbook on gears and speed transformers. Much care and thought have been given to the preparation of this book. It is 5x8 in., carries 316 pages and is profusely illustrated by halftone and line engravings. There are nine sections, as follows: (1) Types A, B, and C speed transformers, compound and worm-gear speed reducers; (2) cut spur gears and pinions, machine-finished racks; (3) bevel, miter and internal gears; (4) worms and worm gears, worm hobs; (5) spiral, spiral bevel, automotive, helical and double helical gears, miscellaneous screw machine parts; (6) Bakelite micarta pinions; (7) rawhide gears and pinions; (8) miscellaneous engineering data. Section 9 is the index, to which are added several memoranda pages.

Brown Instrument Co. of Philadelphia has recently published a 72-page book entitled "Instructions for Installation and Care of Thermo-Electric Pyrometers." There is hardly a man who works with pyrometers who does not at some time desire information regarding protecting tubes for thermocouples and various methods of wiring indicators and recorders, methods of eliminating cold junction errors, methods of installing couples and of checking thermocouples, wiring or the accuracy of the instruments. These subjects are gone into from the practical and theoretical angles as well as such other subjects as open and conduit wiring, mounting the instruments, locating defects in the thermo-electric circuit by various means and many other points which will be of immense interest to the man who has to work with the equipment from day to day. This book also contains temperature millivolt equivalents for thermocouples and conversion of Fahrenheit and Centigrade scales. It is free to users of pyrometers.

Link-Belt Co. Issues Three New Catalogs

Of interest to the general field are three new catalogs just issued by the Link-Belt Co. of Chicago.

PORTABLE LOADER BOOK NO. 650—This 40-page book covers the complete line of Link-Belt industrial loaders, which includes the "Cub" portable belt conveyor, the "Grizzly" power-swiveling loaders, which run on either crawler treads or traction wheels, and their standard types of bucket loaders for handling coal, sand, gravel, stone, fertilizer and similar materials.

ELECTRIC HOIST BOOK NO. 580—A catalog equal in size and attractive make-up to that of the loader book. This book has also been developed with the thought that the greatest value to all could be obtained only by incorporating constructive material and operation data. Considerably over 100 illustrations were used in the 40 pages.

LOCOMOTIVE CRANE BOOK NO. 670—Covering both Link-Belt crawler and locomotive cranes, this book is as interesting a work as any we have recently seen. It has been built along the idea that a picture will tell as much as two paragraphs. Hence it is profusely illustrated with excellent operation views.

Quarry Insures All Its Employes

THE North River Garnet Co., which operates a quarry at North River, N. Y., has insured all its workmen as a group.

Each of the 96 employes of the quarry is insured for $1000 and in the event of illness or accident will be paid a weekly benefit of $10 for a stipulated period. The premiums are to be paid jointly by the employer and employes, the group policy being of the so-called contributory type.

Group insurance of this sort is becoming increasingly common. It appears to be a considerable incentive for the workman to stay with the company that aids him in carrying his insurance.